# MODEL AIRPLANE NEWS

JANUARY

20 CENTS

FEATURING NATIONAL AERONAUTIC ASSOCIATION JUNIOR MEMBERSHIP NEWS

# ALL PEERLESS!

## WACO CABIN BIPLANE

Span 24⅞" ¾" scale Length 18⅜"

This is the newest Peerless Kit and a popular one with Peerless Fans. The model is designed after the large Waco used in advertising by the Waco Aircraft Co. A good steady flying model. Colored cream with green for trim and silver and black for touch up. Kit has PRINTED WOOD. Complete kit with all materials..... **$3.00**

## CURTISS NAVY HAWK

Span 23½" ¾" scale Length 16¾"

Detailed scale flying model. Has bombs, fire extinguisher, removable gas tank, etc. Plans are very complete. Many builders choose this kit to build exhibition model with controls movable from stick in cockpit. Colored yellow, grey, red, silver and black. PRINTED WOOD, of course, Complete kit ..... **$2.75**

## U. S. Army Curtiss Swift

Span 27" ¾" Scale Length 20¾"

Flying model of this streamlined, high speed U. S. Army Fighter. Details include 2 guns, radlator, wing flaps, tube sight, hubless wheels, etc. Very complete drawings. Colored Army Drab and Yellow with silver and black details. PRINTED WOOD. Complete kit ..... **$2.50**

## Lockheed Vega

Span 20½" ½" scale Length 13¾"

The largest of the PEERLESS ½" scale models, and one of the best. Famed for long steady flights. Colored orange with black stripe, black details and silver trim. Kit is complete with many new and interesting developments in model aircraft, PRINTED WOOD. Only ..... **$1.45**

## Curtiss Hawk P-6-E

Span 15¾" ½" scale Length 11¼"

A well detailed flying model of this dependable Army Flyer. Our plans were made from actual measurements and photos of plane used in mail service at Cleveland Airport. Colored Army Drab and yellow with black and white stripes. Complete kit with PRINTED WOOD only **$1.00**

## Wartime British SE5-A

Span 13⅜" ½" scale Length 10"

Designed after a real ship in actual service. Plenty of detail —guns, movable windshield, insignia, brace wires, etc. A good flyer, too. Colored silver with black struts. Kit contains all materials, complete drawings and PRINTED WOOD. Only ..... **75c**

## Vickers Supermarine S-6B

Span 15⅛" ½" scale Length 14"

Authentic flying model of the speed sensation of 1932. Great flyer with plenty of speed. Colored silver and blue. Complete kit with accurate plans and PRINTED WOOD only ..... **$1.35**

## Ben Howards "Ike"

Span 15½" ¾" scale Length 12¾"

Everybody loves the "IKE". This model is authentic having the plans authorized and signed by Ben O. Howard. All white with black numbers and details. Smooth, speedy flyer. Complete kit with PRINTED WOOD only ..... **$1.00**

## Fokker Triplane

Span 18½" ¾" scale Length 14"

Baron Von Richtofen's famous all red fighting Fokker. An authentic model with guns, insignia, adjustable controls, etc. Colored all red, trimmed in black. Complete kit with PRINTED WOOD, only ..... **$1.50**

## Laird Supersolution

Span 10⅜" ½" scale Length 9⅛"

This little beauty is modeled after Doolittle's 1931 Racer. Good flyer as well as exhibition model. Colored green and yellow, black details. PRINTED WOOD and all materials in kit ..... **75c**

## DEALERS!

**Satisfied customers, repeat orders, increased business with a good profit—That is what the PEERLESS line will bring to you. Write for prices and information today. ORDER AT ONCE FOR XMAS TRADE.**

## NEW CATALOG

**All PEERLESS Kits and Supplies are fully illustrated and described in our new catalog. Every model builder should have one. Send 3c stamp for your copy.**

**ADD 10% TO ALL PRICES FOR SHIPMENT WEST OF DENVER.**

## BIRD BIPLANE

Span 25½" Length 17½" ¾" scale

One of the most accurate detailed models on the market; Kinner motor, dashboards covered with celluloid, throttle in cockpit, all brace wires, insignia, etc. Colored Red with Silver wings and tail surfaces, black touch up. Easy to build and a wonderful flyer. Complete kit with all materials, PRINTED WOOD, etc., only .... **$2.25**

## A QUICK LIST OF ALL PEERLESS MODEL KITS

| | |
|---|---|
| Waco "C" Cabin Plane | $3.00 |
| Curtiss F11C2 Navy Hawk | 2.75 |
| Curtiss "Swift" | 2.50 |
| Bird Biplane | 2.25 |
| Army Boeing P12F | 1.75 |
| Sopwith Camel | 1.50 |
| Fokker Triplane | 1.50 |
| Lockheed Vega | 1.45 |
| Supermarine S6B | 1.35 |
| Curtiss P6E Hawk | 1.00 |
| Howard Racer "IKE" | 1.00 |
| Doolittle's Gee Bee | .85 |
| British SE5A | .75 |
| Doolittle's 1931 Laird | .75 |
| Clipper Fuselage ROG | .50 |
| Challenger Stick Type ROG | .25 |

**CHOOSE YOURS AND ORDER TODAY**

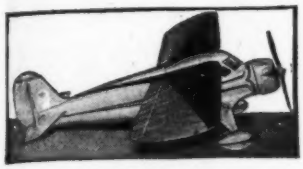
# PEERLESS MODEL AIRPLANE COMPANY

**15531 MADISON AVENUE** **LAKEWOOD, OHIO, U. S. A.**

***Make this a PEERLESS Christmas!***

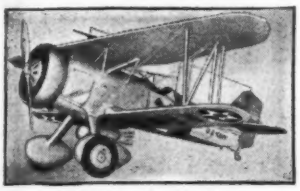
# Here's the PLANE YOU'VE been waiting for

## THE *New*, FAMOUS SUPER-DETAIL *Martin Bomber*



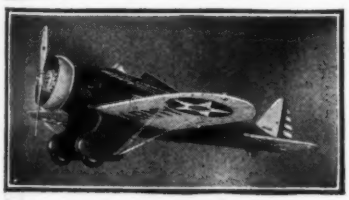
**STINSON RELIANT**

**Wingspan 32 5/16", length 21¼", weight 1½ oz., exact ¾" scale.** Here's a plane you'll be mighty proud to own and fly. An exact reproduction of one of the latest 4 passenger cabin planes. You'll find more unusual and different features in this plane than in any other. For example—adjustable speed arresters built into the wings, the movable cabin doors, the complete interior with four seats and control column, and all the other Super-Detail features. Colored in bright contrasting yellow and black.
**Kit complete, postpaid..... $2.50**



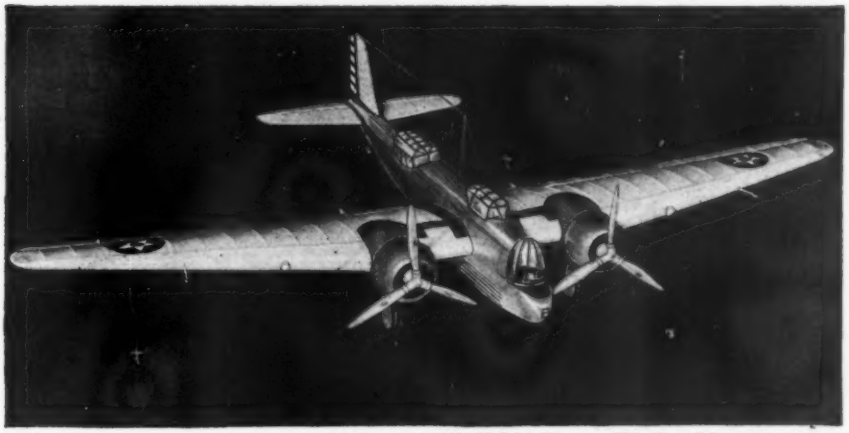
**CURTISS GOSHAWK**

**Wingspan 23⅜", length 16¾", weight 3⅛ oz., exact ¾" scale.** You've heard of this beautiful Curtiss Goshawk. Now you can build your own with the most complete kit you ever saw. This snappy little Navy fighter has many more details than you can see in the photo. Everything designed in exact scale of course. Streamlined drag ring specially designed; two detachable blade propellers, and the entire model coated with the new IDEAL high lustre finish, with silver, yellow, red and black coloring. Plenty of material is furnished.
**Kit complete, postpaid..... $2.00**



**BOEING P-26A**

**Wingspan 21¼", length 18", weight 2½ oz. Exact ¾" scale.** One of the newest, most advanced of all fighting planes. Fast, speedy, with full armament capable of over 240 miles per hour. This flying model is an exact replica of the famous fighter—one that is identical in all but size with its noteworthy big brother. Beautifully colored in olive drab and yellow. All Super-Detail parts included.
**Kit complete, postpaid..... $1.75**



**Wing Span 35"—Length 23½"—Weight 4⅝ oz. Kit Complete $3.50**

**IDEAL brings to you, with all the Super-Detail features and many new exclusive fittings, this famous big, powerful, mystery ship of the army. Beautifully designed, strikingly colored in high luster Olive Drab and Yellow, the Martin Bomber plane has more new and beautiful features than any model you ever saw—one of the most complete flying models ever built.**

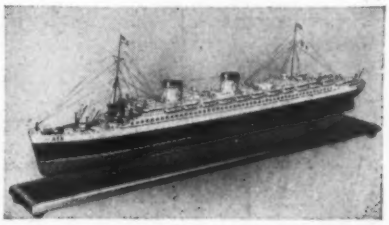
**In addition to the controls which you can actually work from the cockpit—which operate elevator, rudder and ailerons just like the big planes, the Martin Bomber has retractable landing gear, rotating gun turret, movable machine guns, special streamline cowlings, two types of 3 bladed propellers—one for flying and one for exhibition with removable motor sticks for flying; rudder and elevator balanced surfaces; new type freese ailerons—all in all one of the finest, most complete flying models ever built at any price.**

**Designed by experienced flyers—men who have spent their lives designing and building real planes, IDEAL Super-Detail planes have all the features of their big flying brothers. Also the new and exclusive Super-Detail fittings such as—ailerons, rudder and elevator can be set in any position desired for flying and controlled by cables from cabin—IDEAL bright high luster finish—pulleys—control horns—control cable—streamline drag rings—exact scale wood wheels—everything an exact duplicate of the big flying planes.**

***That is why you really learn the principles of aviation when you build planes the IDEAL way*** **... that is why they are exact reproductions, perfect in every detail, why experienced model builders prefer Super-Detail kits. That is why IDEAL received serial number one and was the first to be approved by the Junior Birdmen of America.**

**Send the coupon today for any of the kits pictured. Everything necessary to build a big, beautiful, workmanlike flying job, included in the Super-Detail kit. You only have to follow the complete and simple instructions to obtain extraordinary results.**

### Another NEW Super-Detail model ... the Italian liner *REX*.



**29"—scale 1/32" to the foot.**

An exact replica of the new and beautiful Italian liner ... this Super-Detail 29 inch model has a shaped hull and over 100 metal fittings. 24 cast metal lifeboats; 24 cast stairways, 2 cast anchors; 4 metal propellers; 6 cast bits; 48 metal davits. The Rex comes in beautiful high luster original colors of black, orange, white, red and green; and the kit also contains turned wood parts, printed wood, cement, wood filler, sandpaper, etc. It has full sized plans with complete instructions and 7 photographs illustrating the different stages of construction. A beautiful model, easy to build, for all the hard work has been done for you. **Kit complete, postpaid.... $6.00**

### WHAT THE SUPER-DETAIL KIT INCLUDES:

**Everything necessary to build a big, beautiful workmanlike job is included in the Super-Detail Kit. Finest materials only are used in its construction: Sheets of selected plainly printed balsa, strips of various sizes, etc., sheets of silk tissues, cement, both colored and plain dope, propeller shafts, two propellers, motor plate, rubber motor, wheels, cable cord and all other hooks, pulleys, control hinges, eyelets, washers, sand paper, celluloid, reed, wire and other small but necessary things to make the complete model exactly in accordance with the plans and instructions.**

**IDEAL AEROPLANE & SUPPLY CO., INC.**

**20-24 West 19th Street, New York, N. Y.**

**Pacific Branch:**
**Model Boat & Aircraft Co., 1356 Fifth Ave., San Diego, Calif.**
**Canadian Branch:**
**Canadian Model Aircraft, 3007 St. Antoine Street, Montreal.**

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**DEALERS: You can make more money with IDEAL products. Write for details of more than 100 model airplanes & ship models**

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**20-24 W. 19th St., New York City.**

**Please send the items I have checked. I am enclosing $.....**
**(West of Denver 25c extra. All planes postpaid.) Canadian Prices 40% higher to cover duty.**

| | | | |
|---|---|---|---|
| Martin Bomber ☐ $3.50 | | Curtiss Goshawk ☐ $2.00 | |
| Boeing P-26A ☐ $1.75 | | Stinson Reliant Airliner ☐ $2.50 | |
| Folder with information ☐ 3c | | Rex ☐ $6.00 | |

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*VOL. XI* *NO. 6*

*Edited by Charles Hampson Grant*

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### *In Our Next Issue*

We take pleasure in presenting the second part of **Acrobats of the Sky**, by Lt. H. B. Miller, who draws from a wealth of personal experience to tell you the origin and value of maneuvers.

Stephen Faynor, an expert model builder and designer, gives you complete data and plans to build a flying scale model of the Dewoitine D-33, long distance monoplane.

Robert File shows how you can build a duplicate of his world record soaring glider which established a world's record of 23 min., 13 sec., at the 1934 National Contest.

Edwin T. Hamilton tells how any builder can create an all-balsa fuselage model of unusual flying ability in **Fundamentals of Model Airplane Building.**

In **More About Microfilm**, Herbert Greenberg tells you some secrets of the experts concerning the most advanced wing covering.

There will be many other regular and unusual articles, as the **Albatros Fighters on Parade** (last instalment), **On the Frontiers of Aviation**, which gives plans for two modern solid scale models, **The N.A.A. Junior Membership News, Slipstreams, Air Ways, The Aerodynamic Design of the Model Plane, Aviation Dictionary and Aviation Advisory Board.**

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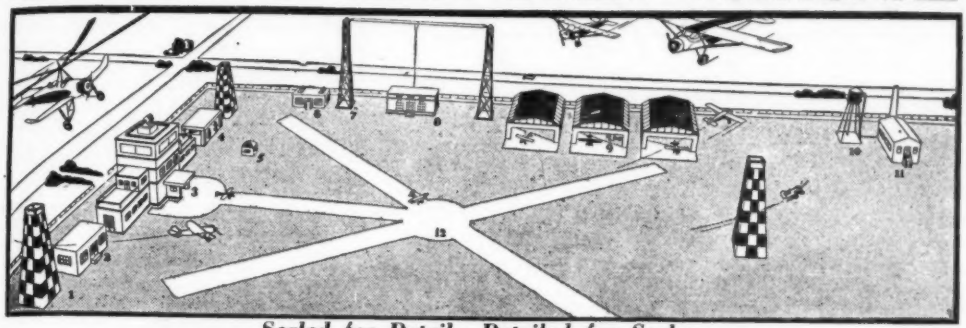
# SELECT YOUR CHRISTMAS GIFT FROM THESE AUTHENTIC—EASY-BUILT NATIONAL MODELS



**Complete to the last detail as shown or each kit separate as listed below:**

| | |
|---|---|
| 1. Three Pylons | $.35 |
| 2. Post Office | .25 |
| 3. Administration Bldg. | .00 |
| 4. Gas Station | |
| 5. Refreshment Stand | .50 |
| 6. Machine Shop | .50 |
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| 10. Water Tower | |
| 11. Power House | .50 |
| 12. Field Mat | .50 |
| 13. Six Commercial Model Kits | .35 |
| 14. Six Sport Model Kits. | .35 |

Airport construction kit, complete, as shown and listed above (plus P. P. 35c) ..... **$5.00**

## *Scaled for Detail—Detailed for Scale*

This carefully detailed model airport, *(an exclusive National development)*, is taking the attention of model builders everywhere. It is providing the individual, schools and clubs with a most interesting and educational project.

NATIONAL MODEL AIRPORT is so complete that you will feel yourself right in the atmosphere of the great airports of the country, as you build and arrange this colorful miniature layout.

The complete kit features ten buildings, three pylons and radio towers. A large ground plan 44" x 62" with its soft green background, runways, aprons and location of buildings marked out. And, of course, a fleet of modern tiny replica planes to take their place about the field or are to be seen in their hangar. A full size, fully detailed plan with instructions guides you in the simple and accurate construction of each unit. The wood for each unit is cut to correct thickness, all details neatly printed out to assure correct size of windows, doors and other detail. Glazing for all openings, an assortment of brilliantly colored lacquers and quick drying cement to build this complete colorful airport. The only tools needed are a sharp knife and paint brush.

**ORDER TODAY TO BE SURE OF YOURS FOR XMAS.**

**NATIONAL MODELS ARE ACCURATELY DESIGNED FOR DETAIL AND FLIGHT.** Simple directions, clear accurate drawings, authentic details, formed wire parts and many other exclusive features make National models easy to build. You can't go wrong—and they fly!

**ASK YOUR DEALER TO SHOW YOU THESE NEW NATIONAL KITS.** If he can't supply you, send your orders direct. Do not accept substitutes and be disappointed.

### 42½" DOUGLAS TRANSPORT

**What a Ship—What a Model! This giant Transport of the Air has established itself triumphant over all commercial air transports. On Nov. 8th, 1934 it broke its own record for flight over TWA between Los Angeles and New York, establishing a new time of 12 hrs., 3 min. it proved the outstanding commercial transport of all entries in the recent England to Australia race by placing second in the phenomenal time of less than 71 hours—for 11,323 miles far in the lead of any other transport.**

**You can't go wrong with National's big three view, fully detailed plan, instructions and complete kit to build this beautiful model for exhibition or flight. It's the most realistic model you have ever seen. The kit includes special cambered balsa for fuselage—roof covering,—turned motor cowls, nose block and wheels, printed wood parts, three bladed laminated props (for flying model), window materials, gearless transmission, duo motor, Jap paper for covering, cement, gray-silver dope and full insignia.**

**This model masterpiece weighs 8 oz. complete, with lights, venturi tubes, windows, doors which open, the new split trailing edge flaps (air brakes), wing and tail lights. Think of a wing span 42½"! A length 29¾"! Then think of the value represented at our low price for the complete kit. Plus 50c packing and mailing charge!** ..... **$5.00**

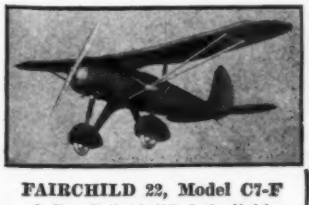
### NEW BEECHCRAFT A-17-F

**A 4-passenger high speed ship.**

**A true ¾" "National" scale model. Wing span 25¾", length 18", wgt. 2½ oz. Colors red and black, silver trimmed. Faithful in every detail including wing and tail controls, deep cowl, navigation and landing lights. This new "National" kit contains many simplified construction features; turned cowl and wheels, stations and ribs, and numerous other parts neatly printed on clear white balsa, making them easy for you to cut out. The safety motor tube is another feature. Kits contain ample cement, colored dope, Japanese tissue, formed wire parts and props. Also full size plan with fully detailed instruction. This is a ship every model builder will enjoy building and can exhibit or fly with pride (Plus P.P. 25c)** ..... **$2.50**

### Col. Lindbergh's Lockheed Sirius Seaplane

**The flying Colonel took his "Tingmissorted" over 39,000 miles of Arctic waste. That was FLYING news. National's authentically detailed ½" flying scale models of this famous ship is MODEL news. Kit contains many exclusive National features for easier construction and better results. Ready turned cowl, all stations printed and numbered to plan. Colors, black and orange, silver pontoons, wing span 21½", length 15½", wgt. 2 oz. Complete kit. (Plus P.P. 15c)** **$2.00**



### FAIRCHILD 22, Model C7-F

**A New National ½" Scale Model**

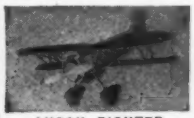
**Span 16½", Lgt. 12½" Wgt. ¾ oz. Colors: green fuselage, orange wing and tail silver trim. Features: Hollow Motor Tube, adjustable elevators and rudder, fully-detailed 3-view plan and instructions. Kit contains all material, with many parts semi-finished. Complete Kit. (Plus P. P. 15c)** .. **$1.00**

### TAYLOR CUB

**A 12" flying scale model of the well-known cabin monoplane. Other 25c kits in this group include Fokker D-8, Bellanca Liberty, Heath Parasol, Puss Moth, Curtiss Robin. Each kit complete including blueprint and instructions. Now (Plus P. P. 10c) each** ..... **25c**

### S. E. 5 4 FAMOUS WAR-TIME MODELS

**Including the Sopwith Camel, S.P.A.D., Capt. Rickenbacker's famous war-time fighting ship, Fokker D-7, S.E. 5 (illus.) These 4 famous war-time ships are 12" flying scale models. Each kit complete (Plus P. P. 10c) each** ..... **35c**



### AKRON FIGHTER

**National offers 18 12" flying scale models: Lockheed Vega (Winnie Mae) Hawk P-6-E, Boeing P. 12, Curtiss Falcon, Curtiss Hell Diver, British Hawker Fury, Polish P-6, Sikorsky Amphibian, Texaco 13, Bellanca Airbus, Gee Bee Sportster 1931, Lockheed Sirius, Laird 400 Albatros, Pfalz, Nieuport Scout, Fokker Triplane. Akron Fighter (illus.) Each kit complete. (Plus P. P. 10c) each** ..... **50c**

## $ Win Cash Prizes $

**26 Grand Prizes Including**

**$75 in Cash Prizes**

**And Hundreds of Local Prizes**

**Anyone can enter—anyone can win. Every plane entered gets a prize!**

**Two Classes:**

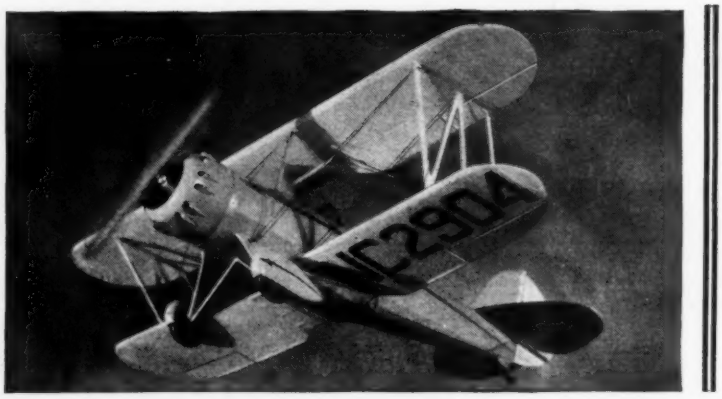
**Junior for Models of 15" and less. Senior for Models of 16" and over. Enroll TODAY. Send 3c to cover mailing for latest catalog and Bulletin of "National" fleet of over 50 planes, a 1000 supply items and full details and rules of this contest.**

**Dealers—Agents: Cash in on the 2nd Big National Model Building Contest. Write for special contest offer and full details.**

# *NATIONAL* Model Aircraft & Supply Co.

**23 Ave. "E"., Bluebird Bldg., Dept. A-55, New Rochelle, New York**

# Boy, how they fly!



## AND THIS NEW WACO IS THE BEST YET!

**The kit sensation of the year. A masterful flying creation perfectly designed and reproduced in every detail. Colored a brilliant orange and cream with black striping and details.**

Waco insignia supplied as well as printed wing and tail numerals, together with plenty of pigmented dope to assure proper finish for model. Our exclusive fuselage design eliminates necessity for motor sticks, allowing finer detail with no increase in weight. Also insures easy construction of lower wing root fairing. Kit contains more than enough of all necessary material to build the complete model, including turned hard wood wheels, printed balsa of finest quality, sandpaper, rubber, etc., etc.

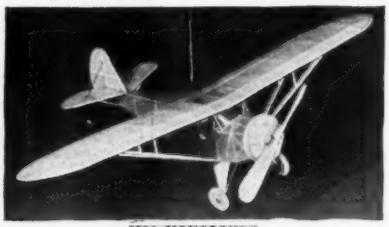
Span 21¼", Length 16⅝", Weight 2.5 oz. Complete kit postpaid..... **$2.75**

## DEALERS! VARIETY! SERVICE!

**Cash in on sales from this well balanced line of TOMASCO kits and supplies. No other line offers such a wide variety of types and prices on QUALITY flying model kits. Liberal discounts allowed. Write on letterhead for details. There is still time for Christmas delivery.**

## ● ORDER KITS ● and Supplies

**See your dealer first. If he cannot supply you, order direct. All kits sent within 8 hours upon receipt of order. Kits carefully packed and sent to insure safe arrival. All kits sent postpaid. Send 3c for illustrated catalog showing other TOMASCO kits.**



**1934 MONOCOUPE**
A snappy model of this well known commercial ship. Correctly detailed with window in wing and window frame in fuselage. Colored orange and yellow with all balsa parts clearly printed. Span 17½", Length 11¼" Weight ¼ oz. **Complete kit, postpaid** ..... **50c**

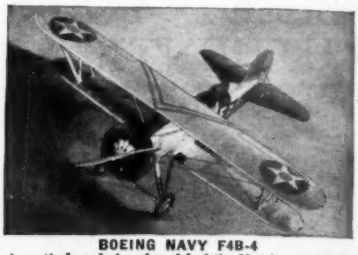
**BIRD BIPLANE**
Our model of the world's safest airplane embodies all the noted performance records of the real Bird. An excellent flying model unsurpassed for distance, climb and stability. Ready made prop, hard wood wheels and printed balsa. Span 18¼", Length 12½" Weight ½ oz. **Complete kit, postpaid** ..... **75c**

**TAYLOR CUB**
America's most popular two place lightplane. A model that follows the prototype in every detail and is especially recommended for beginners. Kit includes ready made prop and colored tissue. Span 15½", Length 10¼" Weight ¼ oz. **Complete kit, postpaid** ..... **50c**

**NO C.O.D.'s. ALL KITS PACKED AND POSTPAID**

## The Toledo Model Airplane Supply Co.

**709 Jefferson Ave.** **Toledo, Ohio**



**BOEING NAVY F4B-4**
An entirely redesigned model of the Navy's super fighter. A perfectly detailed deluxe model airplane kit with 5 colors of pigmented dope and hundreds of printed parts. Span 22½", Length 15", Weight 2.2 oz. **Complete kit, postpaid** ..... **$2.75**

**VON HAUPTMAUN'S FOKKER DVII**
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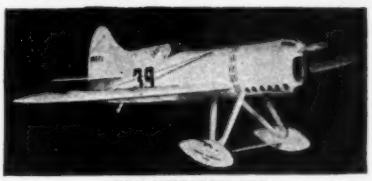

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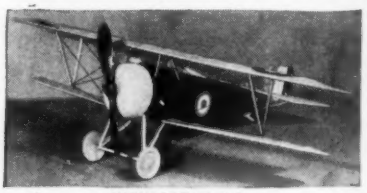

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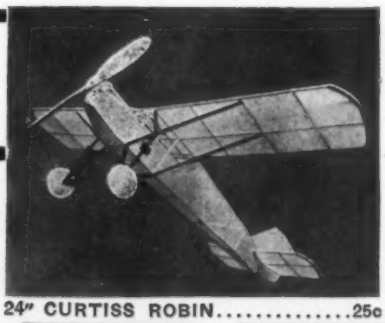

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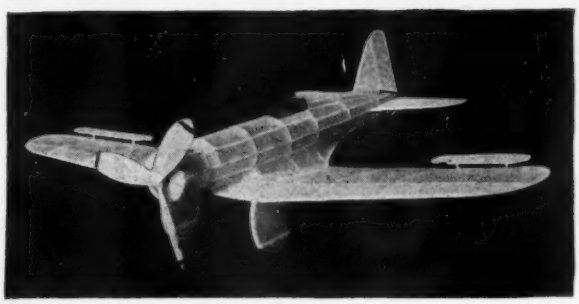

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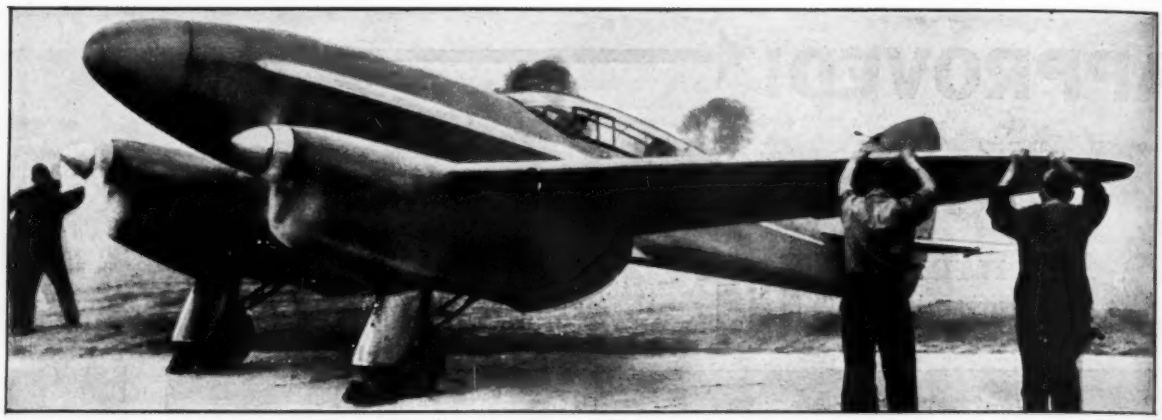


The DeHavilland Comet which C. W. A. Scott and Campbell Black flew from London to Melbourne in 70 hours, 50 minutes, to win

# Half-Way Round the World on a Comet

## How Daring Pilots and Ultra-Modern Airplanes Overcame Enormous Obstacles to Complete the Greatest Flight in History

By FLETCHER PRATT

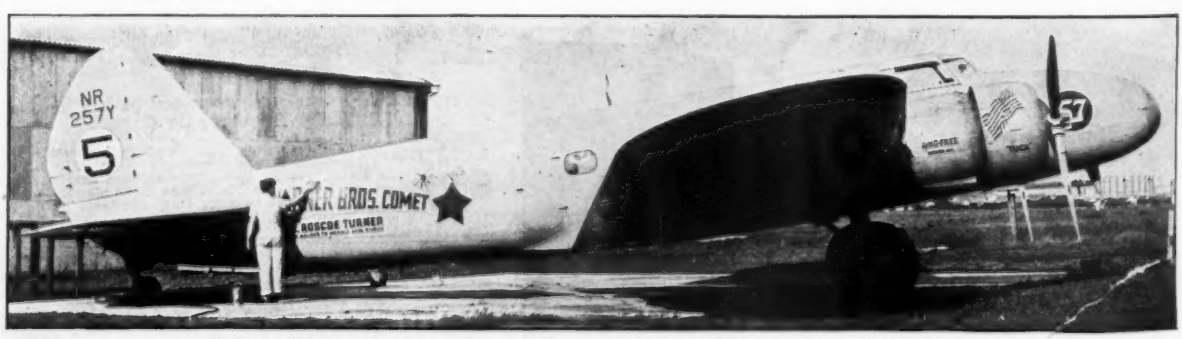
TWENTY airplanes lined up at Mildenhall airdrome, near London, in the cold, blue hour before daybreak. Along the sides of the field were the newspaper cameramen and a thin scattering of sleepy spectators. In front of the twenty machines, the field stretched away to where it seemed to drop off the end of the earth, leaving nothing but slate-grey sky beyond. At the end of the line of airplanes stood an official with a stop-watch in his hand, his eyes fixed on the horizon. As the sun sent the first shaft of yellow light streaking across the field, he threw up his hand and pressed the stop-watch. Another official waved a checkered flag and a thin cheer broke from the line of spectators as a red and black DeHavilland Comet, its twin motors roaring, taxied across the field, then soared into the western sky in a long, graceful curve.

The greatest race in aviation history, the race from London to Melbourne was on!

The greatest race in aviation history and the most dangerous, for the insurance companies demanded twelve per cent premiums on the life of any competitor in it. There were forty-six people, flyers and passengers, on the twenty planes, and that twelve per cent premium meant that the insurance companies, run by conservative, cautious business men, were estimating that at least six of those forty-six people would not survive the race. Before we look at the twenty planes lined up for the start, let us see what lay beyond that belt of grey sky at the end of Mildenhall field to make the insurance people regard it as so desperate a venture.

The first leg of the journey was from London to Bagdad, right across Europe. In landing fields, in facilities for aiding flyers, this portion of the route was splendidly equipped, but Europe in October is nearly always blanketed with clinging fogs, and in the midst of those fogs the aviators would have to either fly over the Alps and the tall Carpathian mountains of Hungary, or around them. Once they cleared that obstacle, they had the Arabian desert down to Bagdad to negotiate. It has its peculiar danger — the dreaded sandstorms, which blow up with lightning swiftness, clogging motors and carburetors. They rise to enormous heights; you cannot fly over or around or through them; the only thing you can do is turn around and try to run back before the storm. And on this leg also there were the eagles and kites of the desert to face—"Avoid these birds at all costs" said a leaflet of instruction that was distributed to every flyer before the start, "they are very likely to attack your machine and smash a propeller."

Beyond Bagdad the course lay to Allahabad in India, over the most dangerous leg of all. It would certainly be a night flight for no one counted on arriving at Bagdad before evening, and the luckless racer who stopped over night there would be passed by bolder competitors. And the course lay for over 2000 miles either through or around the Persian mountains. Those who flew through the mountains would have to go at an altitude of over 15,000 feet, picking their way through narrow passes in the dark, with certain death on the rocks as the price of engine



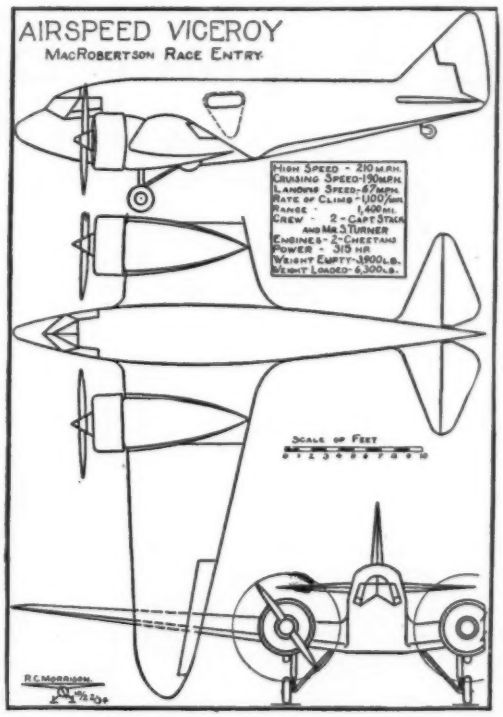

The stock Boeing Transport flown by Roscoe Turner and Clyde Pangborn. It placed third

**The Bellanca Racer, "Irish Swoop," which was eliminated at the last minute by the race committee. It was picked to win by many**

failure or any fault in reckoning. Those who flew around the mountains would have to follow the rock-bound coast of the Persian Gulf, with no landing fields and no beach, and death just as certain down there in the blue waters if they failed.

The next leg lay from Allahabad to Singapore, 2200 miles long. Sixteen hundred miles of it was over the shark-infested waters of the Bay of Bengal, with no radio compass stations and few ships to rescue a flyer who made a forced landing. The other 600 miles were over the jungles of Malaya where there are lots of snakes but no landing fields, and the tropical hurricanes come at you with the speed of bullets.

From Singapore to Darwin, at the tip of Australia, was another oversea jump, with the tip end of the island of Java the only land on the leg. At Darwin, the flyers could rest a moment before taking off across another range of mountains and another desert, the great Australian desert, to Charleville. The flying problem here was of another kind — that of navigation. Charleville is a collection of perhaps twenty houses, a mere dot on the map. The desert stretches away in empty silence on all sides, without a single landmark. Ten miles off course and you could miss the town altogether; your plane, its gas supply exhausted after the 1500 mile run from Darwin, would have to come down on the sands, and the chances are that neither you nor it would ever rise again. And after Charleville, there was a "short" hop to Melbourne—a mere 800 miles, only about the distance from New York to Toledo.




The whole course included every possible kind of flying weather, from the fogs of Europe, through the mountain cold of Persia to the heat and thunderstorms of the tropics. It included every type of aerial navigation—over civilized country, dry desert, ocean and jungle; in fact everything a pilot would meet if he lived a hundred years and flew planes all over the world. And as such, it was probably the most severe and comprehensive test that flying men and machines have ever faced.

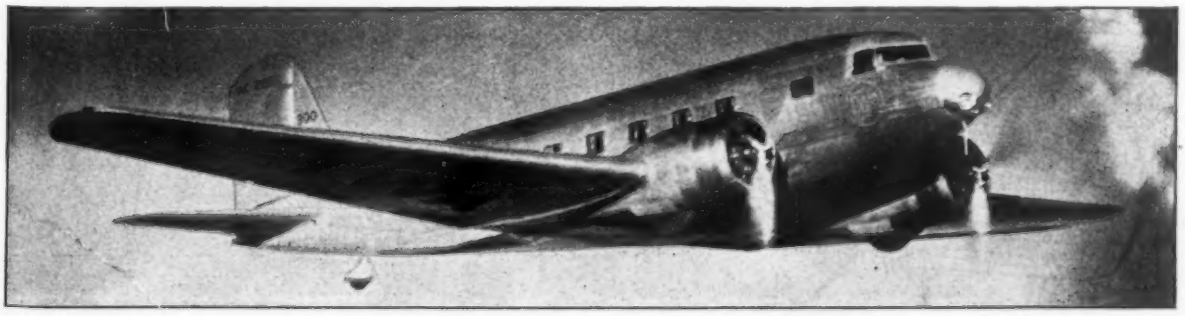
Yet twenty machines and forty-six flyers were on the starting line to face it. Of the twenty, ten outfits were really important; the rest were flying the course more in a spirit of sport. Now that we have seen what they had to do, let us glance at those ten ships and crews.

Three DeHavilland Comets; one of them manned by the flying Mollisons, James and Amy, with fine records of success in long distance flights all over the world; one by C. W. A. Scott and Campbell Black, English pilots who had already flown from London to Australia; one by Cathcart Jones and Walker, bomber pilots from the British air service. Their machines were the latest development of British aviation—a twin-engined, low wing racing plane, with a rated speed of over 200 miles an hour.

Two Fairey Foxes; one piloted by Flying Officer Gilman, a British distance flyer, and one by Parer and Hemsworth, the best men of the British colonial air service in New Guinea. The Fairey Fox is a single-motored day-bomber and observation machine, common in the British air service, with great speed and a record of good endurance.

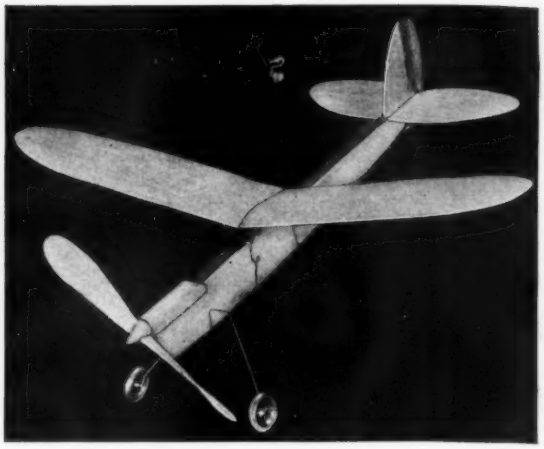
The American Boeing transport, a stock

*(Continued on page 29)*



**The Douglas transport flown by Parmentier and Moll. It placed second in the main event and first in the handicap race**

The finished model ready for flight is graceful, stable and an excellent flier. Flights can be controlled by the adjustable wing and movable rudder. Weight 1¼ to 1½ ounces



# Fundamentals of Model Airplane Building

## How to Build a Simple All-Balsa Fuselage Model. A Complete Course for Beginners Who Wish to Become Expert. Part No. 9

By EDWIN T. HAMILTON

ALL of the models presented in the eight articles that have made up this course to date have been of the "stick" variety. In other words, they have had single or twin sticks in place of the usual fuselage found on real planes.

This month Mr. Grant presents the first model having a real fuselage. As it is the first to be presented, its construction has been keep most simple so that all may build it with ease. It is an all-balsa fuselage model that none—from beginner to expert—can afford to miss building and flying. Your writer is proud to present it under his name, as it is a "typical Grant job," which means the best in all departments of model construction and performance.

Weighing but 1½ ounces, its flying qualities are exceptional. Flights of 250 feet can be secured consistently with the motor only hand-wound, while these can be increased to 500 or 600 feet if the motor is lubricated and then stretched in winding. In fact, practically all these distances have been bettered during test flights. If a winder is used, durations of 45 seconds or more can be easily obtained.

It will be found that these figures are most conservative as none of them allow for possible effects of thermal air currents. The model has exceptional stability. Its center of gravity is low, its line of thrust high and the center of lateral area nearly coincident with a horizontal line passing through the center of gravity. This latter fact enables the motor to make sharp turns without banking excessively and diving.

The hinged rudder will be found an added attraction, inasmuch as this allows it to be put through various maneuvers in the air. Add this to its natural stability and you will find that the setting of wings and rudder permits predetermined maneuvering with precision.

### Fuselage

The fuselage is made up of two stringers, two sheet sides, one nose block and five struts. Let us cut the side pieces first. These require two pieces of light sheet balsa measuring 1/32" thick, 1¾" wide and 17" long. Rule a sheet of paper with ¼" squares and on it copy the form of the side, as shown in the graph section of the plan. Trace this form on the two sheets of balsa and carefully cut them out. Finish both with a light sandpapering and then test them for perfect duplication by placing one on the other. See that all sides match.

The two stringers are now cut. Both must be ⅛" thick, ¼" wide and at least 17" long. As the under stringer is shorter than the upper one, each should be completed and assembled between the side pieces separately. Let's complete the top first. This extends between th top edges of the side pieces along their full length, as shown in the plan under "Side View." As the form of the fuselage tapers to a point at its trailing or rear end, the stringer must also be tapered. Note this form in the graph portion of the plan under "Taper Fuselage at Rear."

This taper starts 2 1/16" from the rear end. Taper both sides of the stringer until they meet at the center in a knife edge, as shown. Before this stringer is attached to the side piece, the propeller bearing and rear hook should be attached. Cement a regulation bearing to the top of the stringer at its leading end, as shown in the plan under "Side View."

The rear hook is bent from No. 14 piano wire or from .045 hairpin wire, which can be readily bent. Note the shape of this hook in the plans under "End Hook." It is shown full size. The under bend is not made until after the wire end has been thrust through the top of the stringer 2¼" from its trailing end. Thrust this through the top of the stringer and then bend its

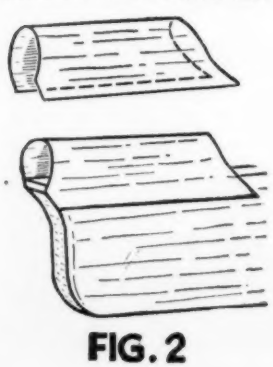


FIG. 2

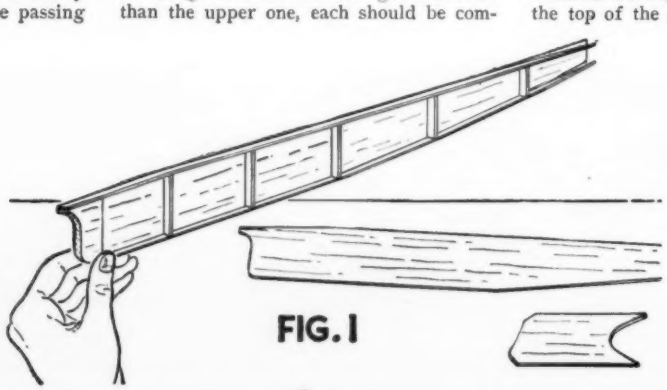


FIG. 1

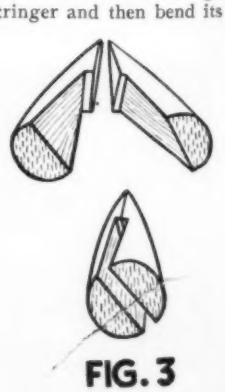
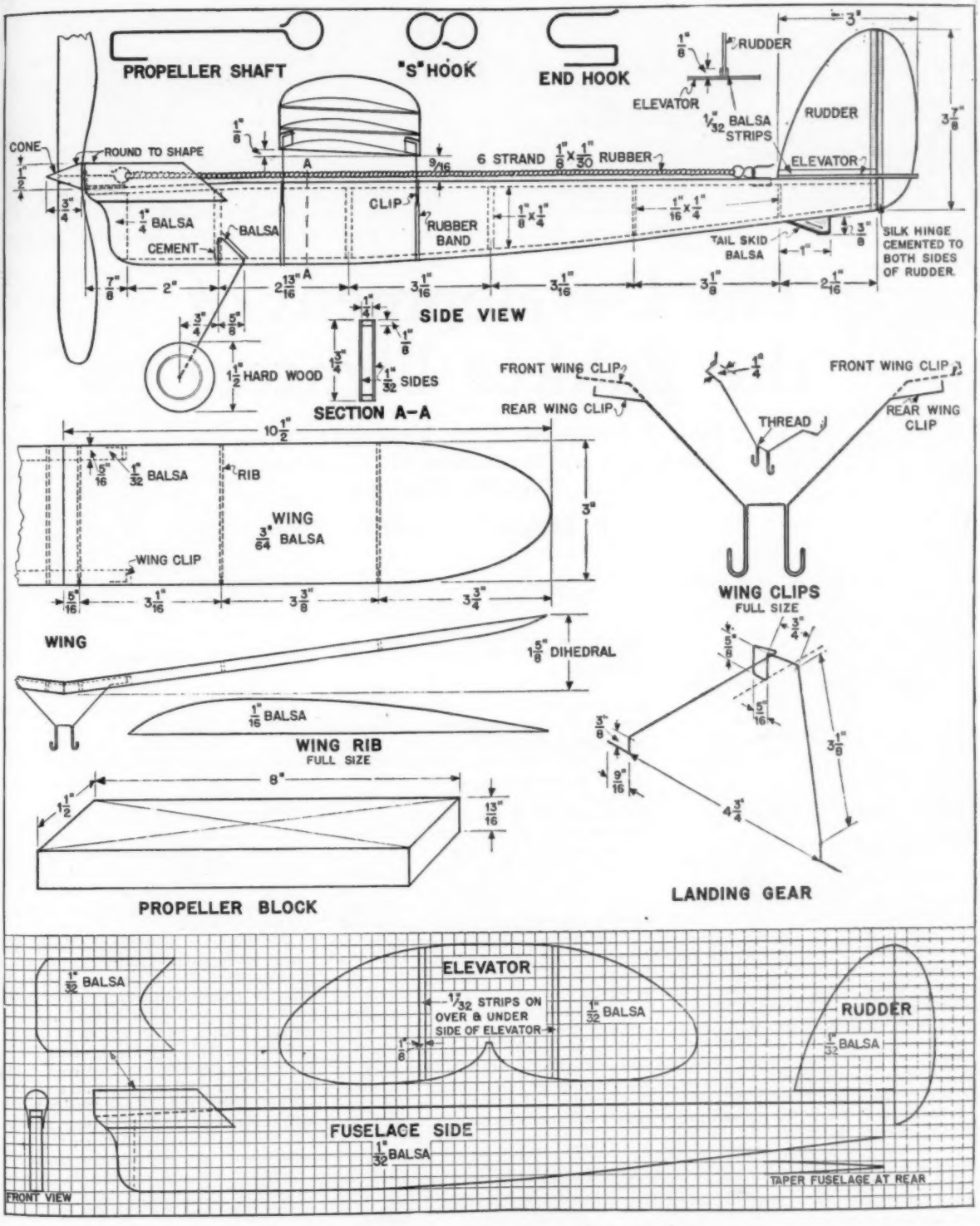


FIG. 3




end up, as shown. A drop of cement will hold it in place. When this rear hook is in place, return to the propeller bearing and wrap it tightly with thread, as shown in the plans. It is for this reason that these metal fittings are secured in place before the stringer is attached in place. *Place one of the side pieces flat on the table.* Cement the stringer you have just prepared along its upper edge, as shown in the plans under "Side View." Note that the stringer is cemented to the side by one of its 1/8" sides, as can be seen in the plans under "Section A-A."

As the end of the stringer is tapered, the side piece must be bent in to fit it, but this is not done until the remaining stringer and struts have been cemented in place. The struts are now cut to proper thickness and width, but not to length, as this is better done after the second stringer has been attached in place. Three of the struts are 1/8" thick and 1/4" wide. Square up a single length of about 6" for these first three struts. The two remaining ones are 1/16" thick and 1/4" wide. A single

*(Continued on page 32)*

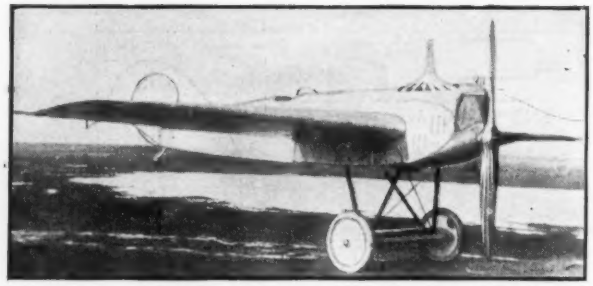


Fig. No. 2. Fokker V. 20, an improved version of the V.17

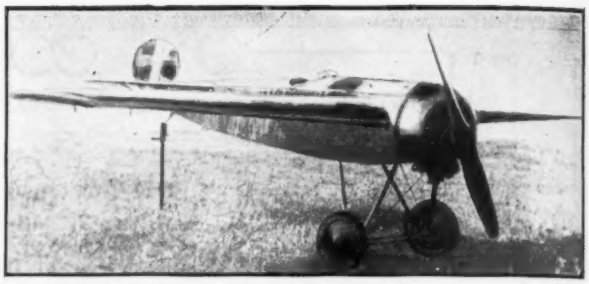


Fig. No. 1. Fokker V. 17 full cantilever monoplane; 110 h.p.

# The Development of the Fokker Fighters

## How Experiments With Radical Designs Resulted in the Production of One of the Finest World War Fighters

By ROBERT C. HARE

Part No. 12

WHILE tests were being made with the V. 13 Fokker experimental pursuit plane which eventually led to the design of the D.VI, the Fokker plant at Schwerin was engaged in the construction of a radically new type of airplane which had been tried before only by Fokker and Junker in their co-designed J.2 monoplane.

The first of the new ships was listed on the factory records as the V.17 and like so many of Fokker's War designs, compared favorably with modern aerodynamic design and construction.

In general appearance the V.17 was a full cantilever mid-wing monoplane. The internally braced master plane was constructed of two box spars, upon which were mounted 14 ribs in each panel. For the first time Fokker absolutely eliminated all outside wing bracing by lowering the wing into the body. The two spars carried through the fuselage and were mounted upon two spar-bearers running on the flight axis. Interior fittings made assembly or disassembly a matter of a very few minutes.

The airfoil section used on the V.17 not only varied in height but also in chord with the result that in one wing panel there were no two ribs alike. It is said that German government engineers at Aldershof who were chosen to chart the upper and lower ordinates of the various sections on the V.17 wing, found a job which lasted over a period of weeks. In the standard straight chord wings used on the Roland and Rumpler machines of the same period, it was a simple matter to test the two possible differences in airfoil section, but the Fokker designed wing necessitated 14 separate tests before the value of the wing could be determined. It might be pointed out here that possibly the great amount of labor, woodwork and engineering required on a Fokker machine during the stressed War days in Germany left much to be desired by the High Command in spite of the excellence of Fokker types. This opinion is vested in the fact that the German authorities purchased more easily constructed planes instead.

Non-balanced ailerons used in the V.17 were a decided breach of policy adhered to since the Fokker DR.1. Control wires for this member were led inside the wing to the kingposts near the aileron tip.

The fuselage of the V.17 was similar in outline to the body of previous rotary-powered Fokker types since the Triplane, but its internal construction details varied considerably. Four steel tubing longerons formed at the cockpit a nearly perfect square in fuselage cross-section. Wire braced uprights of steel tubes formed the cross members of the body and made a remarkably rigid structure.

Mounted on the front ends of the longerons was the circular motor plate stamped out of sheet steel. Lightening holes provided passageways for engine controls and fuel lines to the petrol tanks located in the fore part of the body. Gasoline for approximately three hours was carried in the V.17. To provide as much as possible of the efficient round section of the motor cowling, the sides of the fuselage were built up in front to taper back to the flat sides of the body near the tail assembly. A rounded superstructure on top the longerons rounded off the fuselage and provided a well protected cockpit for the pilot.

Beside the regular outline construction of the fuselage, it was necessary to construct a special member for the attachment of the mid-wing. Called the spar-bearer, this member consisted of a length of large diameter steel tubing welded to a superstructure built on the lower longerons. Fittings were welded on the spar-bearer to engage the fittings of the wing.

A regular "V" type undercarriage was attached to the fuselage, the forward members fitting into sockets bolted to the engine bearer plate and the rear members joining fittings on the lower longeron. The wing on the axle was omitted in the V.17. Rubber shock cord eased the shock of landing.

The empennage was essentially the same as that used on the Fokker Triplane; steel tubing framework with fabric covering. Power was supplied by an Oberursel rotary nine cylinder motor of 110 horsepower driving an Axial propeller of about 8 feet in diameter.

Little can be said in favor of the design of the V.17 as a whole except that it was an interesting experiment at speed and efficiency. The pilot would certainly have a very serious blind spot forward and down and the lack of headrest would make a nose-over fatal.

We must not, however, condemn this plane too severely because it proved a number of Fokker's theories and made valuable contributions to future designs.

As shown in Figure 1, the V.17 was covered with a streaked cloth to aid in camouflage. This streaked system of concealing an airplane was used on a great many Fokker types and led to the evolution of the familiar printed Fokker design which will be discussed in a later chapter. Dimensions and data on the V.17 are not known but the writer would estimate the following: wing span 27 feet, fuselage length 21 feet, high speed 118 m.p.h., climb the first minute 1300 feet.

Following his policy of trying every conceivable combination of wings or fuselages that seem to offer any promise, Fokker next designed the V.20. One might ask just where the

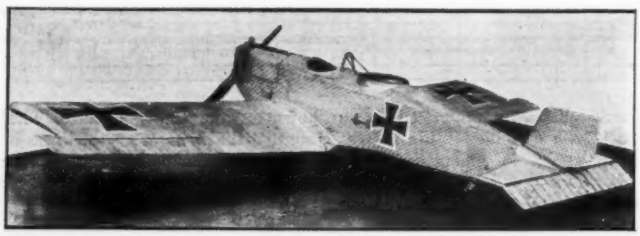
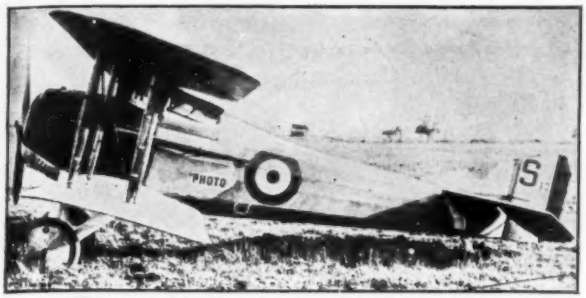


Fig. No. 4. Fokker-Junkers CL. 1 ground attack monoplane—and some of us think our present day "low-wings" are up to date



The type of Spad used against the Fokker D.VI in 1918

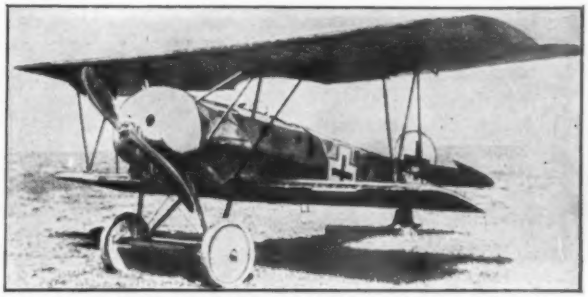


Fig. No. 3. Fokker D.VI saw service on all fronts

V.18 and V.19 types entered into the history of Fokker development. In all probability these models never progressed any farther than drawing board stage, where for some reason they were abandoned.

In the V.20 type, Fokker went back to the V.11 for the fuselage inspiration. With it came the water-cooled engine with the consequent addition of weight. In order to advantageously use the added horsepower, the new type was much larger in general dimensions, area and proportionally heavier. And late in 1917 when the V.20 was wheeled out for its first flight, great things were expected of it.

Again of the mid-wing monoplane design, the Fokker V.20 would have made a formidable foe in battle. The wing construction claimed 16 ribs mounted on two box spars. The typical thick section at the roots carried less under camber than previous airfoils, presumably to aid in speed. The taper in plan was less pronounced than its predecessor. Ailerons in this case were of the balanced type controlled by cables inside the wing. Attachment to the fuselage was similar to that of the V.17, except that the position of the plane nearly made it a low-wing.

In fuselage structure the V.20 was interesting, and several factors related to the use of the water-cooled motor provided better opportunities for aerodynamic advance and military necessities. The framework was composed of the regular Fokker steel tubing units outlining the fuselage. sets of louvres let in just in front of the wing provided ventilation. Exhaust gases were carried over the pilot's head by a series of six tubes converging and forming one outlet pipe as shown in Figure 2.

In order to provide better visibility, the cockpit was let into the body at the middle. A small wind screen of celluloid sheet protected the pilot to some degree. The round turtle deck tapered to the rear of the fuselage. No headrest or head protection was provided for nosing over.

Streamlined steel tubes formed the four landing-gear struts. The upper extremities were fixed to ball and socket joints welded to the lower longeron. The familiar auxiliary wing was again used over the axle.

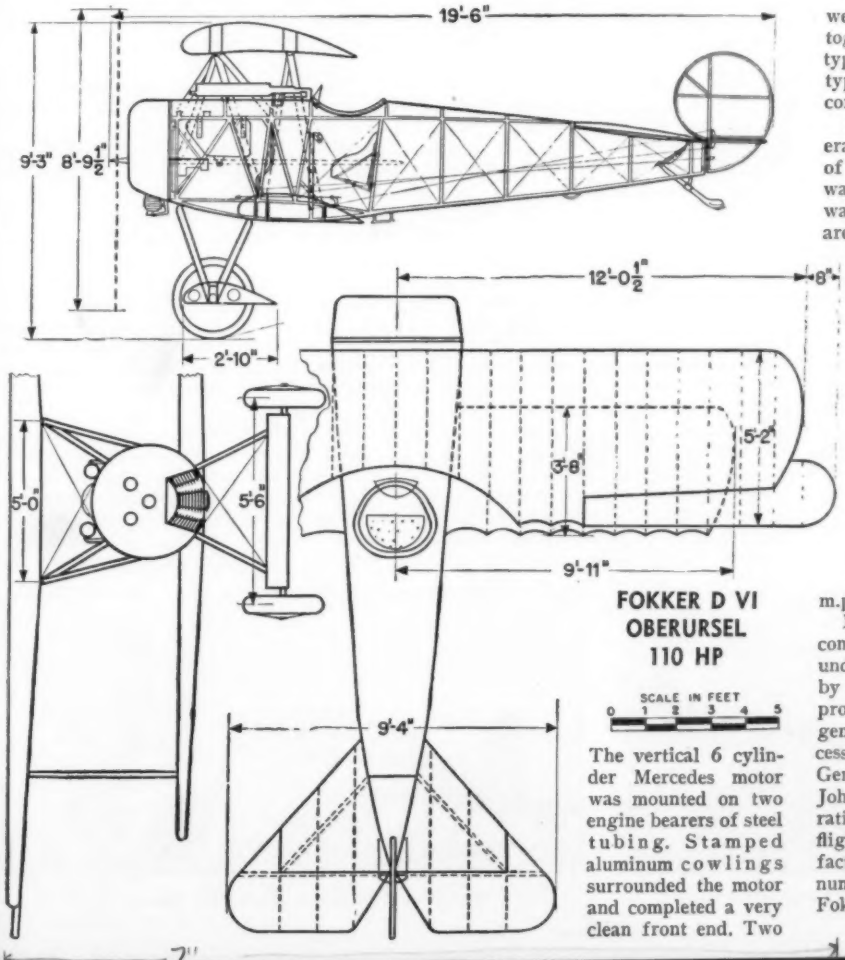
Rudder and horizontal tail plane frames were made of steel tubing units welded together. The elevator was of the balanced type while the rudder was a circular comma type. The tail skid was sprung on rubber cord.

In general design ,the V.20 was considerably in advance of the V.17 in a number of cases. Aerodynamically, the fuselage was better streamlined and the use of the water-cooled motor offered less frontal area. The heavier and longer engine lengthened the body considerably and at the same time afforded a deeper body in which to house the pilot. By lowering the wing, the pilot's view forward and down was improved with no restrictions to the view overhead. The cockpit set back in the fuselage located the pilot behind the trailing edge of the wing far enough to enable him to see well downward and forward under the wing, as well as over it.

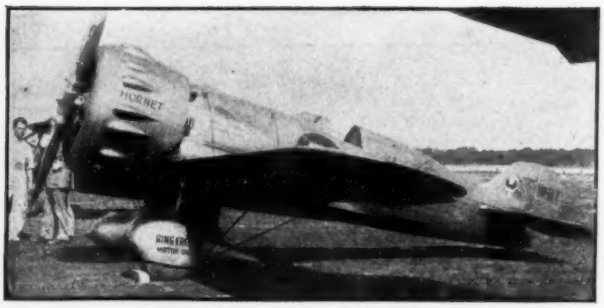
Again authentic specifications and data are lacking, but an estimate at the overall length would be 23 feet, wing span 30 feet, high speed 125 m.p.h. climb the first minute, 1200 feet.

Next in the line of the Fokker Fighters comes a very saucy-looking biplane which underwent its first test flight at Schwerin by the firm serial number of V.21. It proved to be an excellent machine and in general performance exceeded its predecessors by a wide margin. At Aldershof the German engineering center and at Berlin-Johannisthal, its flights and performance ratings were admired by all who saw it in flight. After proving its worth to the satisfaction of the Imperial officers, the serial number was changed to D.VI, the first Fokker biplane to be accepted since the

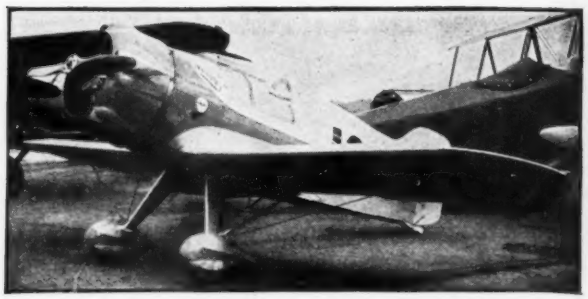
*(Continued on page 34)*




The vertical 6 cylinder Mercedes motor was mounted on two engine bearers of steel tubing. Stamped aluminum cowlings surrounded the motor and completed a very clean front end. Two



Turner's Wedell Williams No. 57. 1934 Thompson Trophy Winner



The Rasmussen Racer, not a miniature Wedell-Williams

# On the Frontiers of Aviation

## Highlights of the 1934 National Air Races Which Climax a Fourteen Year Development of Airplane Racing in the United States

By ROBERT C. MORRISON

IT WAS as far back as 1920 when the aviation industry was practically at a standstill, that Mr. Joseph Pulitzer offered a valuable trophy as a prize to the one winning a certain race (closed course) of a meet held on November 25 at Mitchell Field, Long Island, N. Y. It was Mr. Pulitzer's purpose in offering the trophy to stimulate interest in the aviation industry. He evidently was successful as sixty-three entries competed in the race. Thus was the beginning of air racing that was soon to lead to our great National Air Races.

Among the pilots that competed in that first race was Bert Acosta, proclaimed by Admiral Byrd as one of the greatest pilots that ever lived. He placed third in the race, flying an Ansaldo S.P.A.

The next year at Omaha, Nebraska, Bert Acosta won the second Pulitzer trophy by maintaining a speed of 176.76 m.p.h. He flew a Curtiss Navy biplane that year.

In 1922 Detroit was the scene of the races and this year there were six additional races beside the Pulitzer Race, one of which was the first for commercial planes. Lieut. Lester J. Maitland, famed for his Hawaiian flight several years later, placed second in the Pulitzer Race this year, it having been won by Lieut. R. Maughn in a Curtiss Army plane at 205.8 m.p.h.

It was during the Detroit meet that the National Aeronautic Association was formed and from it evolved our present National Air Races.

Interest was steadily growing in air racing and in 1923 there were more planes than ever built for the races. C. S. "Casey" Jones came into the picture this year by winning the Derby from Garden City, Long Island to St. Louis. Al Williams who is still performing at National Air Races, won the 1923 Pulitzer Trophy.

Year after year passed and in each succeeding year greater developments in aviation occurred through the influence of the National Air Races. Such famous men as Lieut. T. G. Cuddihy, the late test pilot for our Navy, C. C. Champion, James G. Ray, now noted as an autogyro expert, A. H. Krieder and the late Charles "Speed" Holman, participated in the early days of the air classic.

The 1928 Races partially lost their first purpose, that of encouraging the designing and building of new and faster aircraft and was held chiefly for the purpose of making the public "air minded." 300,000 people flocked to see them at Mines Field, Los Angeles. They were a huge success from all points of view except for their main purpose, that of making the public "air minded." The result was entirely the opposite. After watching the hair-raising stunts and "crack-ups" of all sorts, the on-lookers gained the wrong impression of aviation as it actually was, and many left the field solemnly swearing that they would never go up in an airplane.

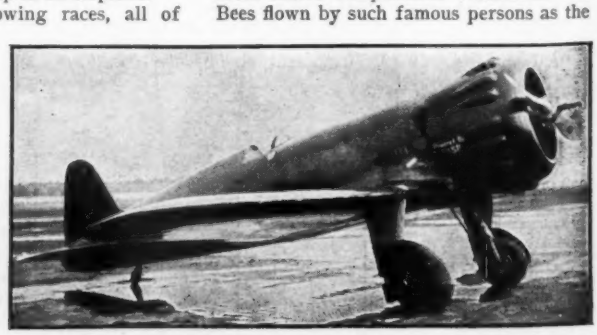
Some of the following races, all of which were ten day affairs, were not financial successes though many thousands of people attended them.

Directors Clifford and Phil Henderson, who are to be credited for the bringing of the National Air Races to the American public each year, had many a hard struggle in directing the annual event, but their persevering nature kept them from being defeated. They have made the National Air Races the world's supreme air classic. This year, at last, the National Air Races were crowded into four full days of thrills. Cleveland was host to the 1934 races and will probably be as such for the next three years.

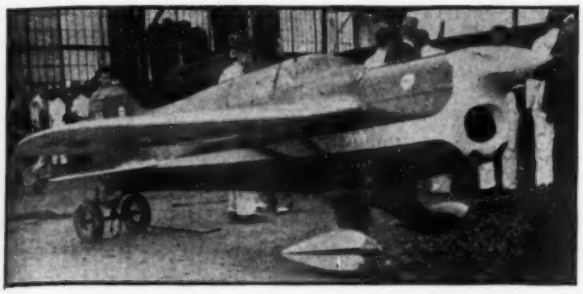
The National Air Races first came to be an important factor in 1929 when the late Doug Davis was the first civilian to vanquish the Army and Navy in closed course competition. He flew the first of Walter Beech's famous Travel-Air "Mystery Ships" at an average speed of 194.90 m.p.h. It was this performance that began America's great accomplishments in the designing of our super-air transports, making us the leader of the world. Our Douglas, Lockheed, Boeing, Northrop, Beechcraft and other ships, are direct descendants of that famous "Mystery Ship." We owe much to Walter Beech and Doug Davis.

Attracted by the performance of the "Mystery Ship," Charles E. Thompson decided to post a trophy to further stimulate the building of large super-racers, the Pulitzer trophy having long been recalled from active competition. Numerous Gee Bees flown by such famous persons as the

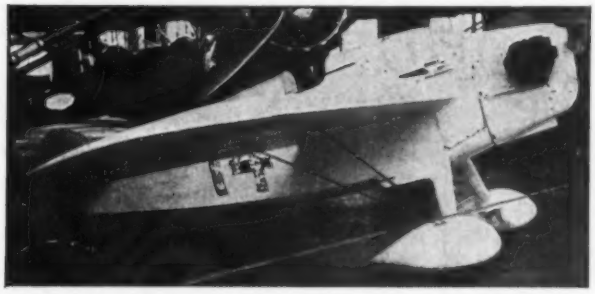
The Wedell-Williams No. 44 in which Doug Davis crashed



The latest Wedell Williams, piloted by Johnny Worthern



Art Chester's "Special" was always in the money



Art Davis' speedy Houser Special, with a Continental A.45 engine

late Lowell Bayles, Jimmie Doolittle, Russel Thaw, the late Russel Boardman, Lee Gehlback (who is still flying them), and the late Florence Kligensmith, were developed for Thompson races. Wedell-Williams, Lairds, a Springfield racer and a Curtiss high-wing ship are other large racers that have been flown in the world's speed classic.

The 1934 National Air Races, which have recently passed, have been the greatest of all. The public jammed the grand stands at the large Cleveland field and the total amount of the gate receipts was greater than expected. An estimated net profit of about $45,000 was made.

Miss Los Angeles, designed by Lawrence Brown and piloted by Roy Minor, placed 2nd in the Thompson Race at 270 miles per hour

Out of the nine entrants in the Bendix Trans-continental Speed Dash only two finished within the time limit to receive a part of the large cash prizes. The late Doug Davis came in first with his old Wedell-Williams. Johnny Worthern, Wedell-Williams air line pilot, flew the new Wedell-Williams to second place. This ship did not live up to expectations, but still it was very fast—when it stayed together.

Its tapered wing was of full cantilever design which enclosed the landing gear when retracted. The whole ship was covered by a thin metal skin which undoubtedly took up most of the stress. The cockpit was of the conventional Wedell-Williams design, but the tail was much different from its three successful predecessors. It had a slightly less surface area and was much cleaner in design, fairing neatly into the tail of the fuselage.

Another new interesting racer in the Bendix Race was the Granville, Miller & DeLackner Q.E.D. "77" giant racer and sport plane. This clip was completed just prior to the trans-continental dash and did not have time to be adequately tested before competing. Because of this, Lee Gehlbach, pilot, had trouble with the ship's engine and was delayed considerably at the start, which prohibited him from reaching Cleveland in time to be in the money. This ship, like the new Bellanca MacRobertson entry, is a direct result of experiments with racing planes in the National Air Races. It has been built not only for long-distance racing purposes, but also as a safe practical sport plane for the experienced flier. Wing flaps are employed to decrease landing speed. It is powered at present with a Pratt & Whitney Hornet, but is built for any large radial engine. Plans of the Q.E.D. are included in this article.

A day after the Bendix Race, Roscoe Turner dashed across the continent in his colorful uniform and revamped Wedell-Williams to break the existing record already held by him. He made one of his stops at Cleveland to take on fuel and was forced to take off in a blinding cloud-burst after refueling. A 1000 h.p. Hornet pulled him to his new record of ten hours and two and a half minutes.

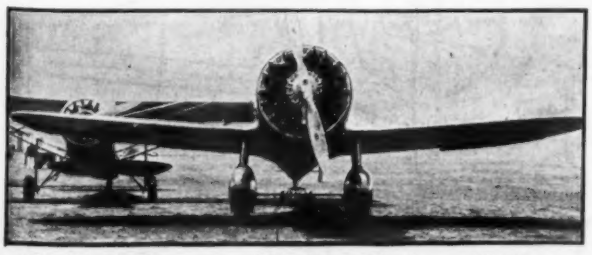
Among the smaller racing planes, Roy Minor's "Miss Los Angeles" was of the most interest, for many reasons. Mr. Lawrence Brown, its builder and designer, has built many other small racers such as Lee Miles' ship that competed this year. The "Miss Los Angeles" has performed so well at the races that several more of like design are also going to be built and they will not all be racers! One will be a military pursuit plane; (A further description of this will be given in next month's issue). Another new one will be a larger racer designed to break the world's speed record!

Specifications of Roy Minor's job are as follows:

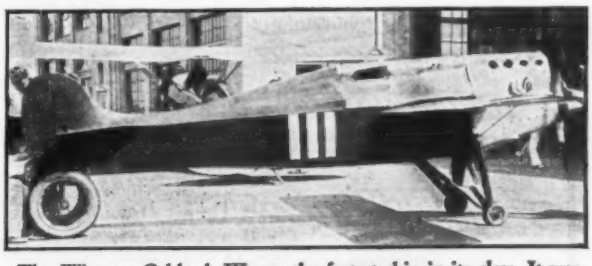
Type—Wire-braced, low-wing, single-place monoplane. Span—19′ 3″. Length—19′ 10″. Weight empty—882 lbs. Gross weight—1299 lbs. Wing loading—21.65 lbs. per sq. ft. Power loading—4.33 lbs. per h.p. Fuel capacity—30 gals. Oil capacity—4 gals. Propeller—diameter 6′ 6″, Hamilton-Standard hub with special racing blades by Story-Cawley. Engine-Menasco "Buccaneer" C-6-S—544 cu. in., rated at 300 h.p. at 2800 r.p.m.—weight 418 lbs. Top speed—approximately 270 m.p.h. in initial tests. Landing speed—50-60 m.p.h. with flaps. Landing gear—Goodyear air wheels. Instruments—Air speed indicator, tachometer, oil temperature indicator, oil pressure indicator, cylinder head temperature indicator, altimeter.

Though the ship was not quite as fast as the larger racers, it outmaneuvered them and thus kept well up in front. It has great structural strength and plenty of

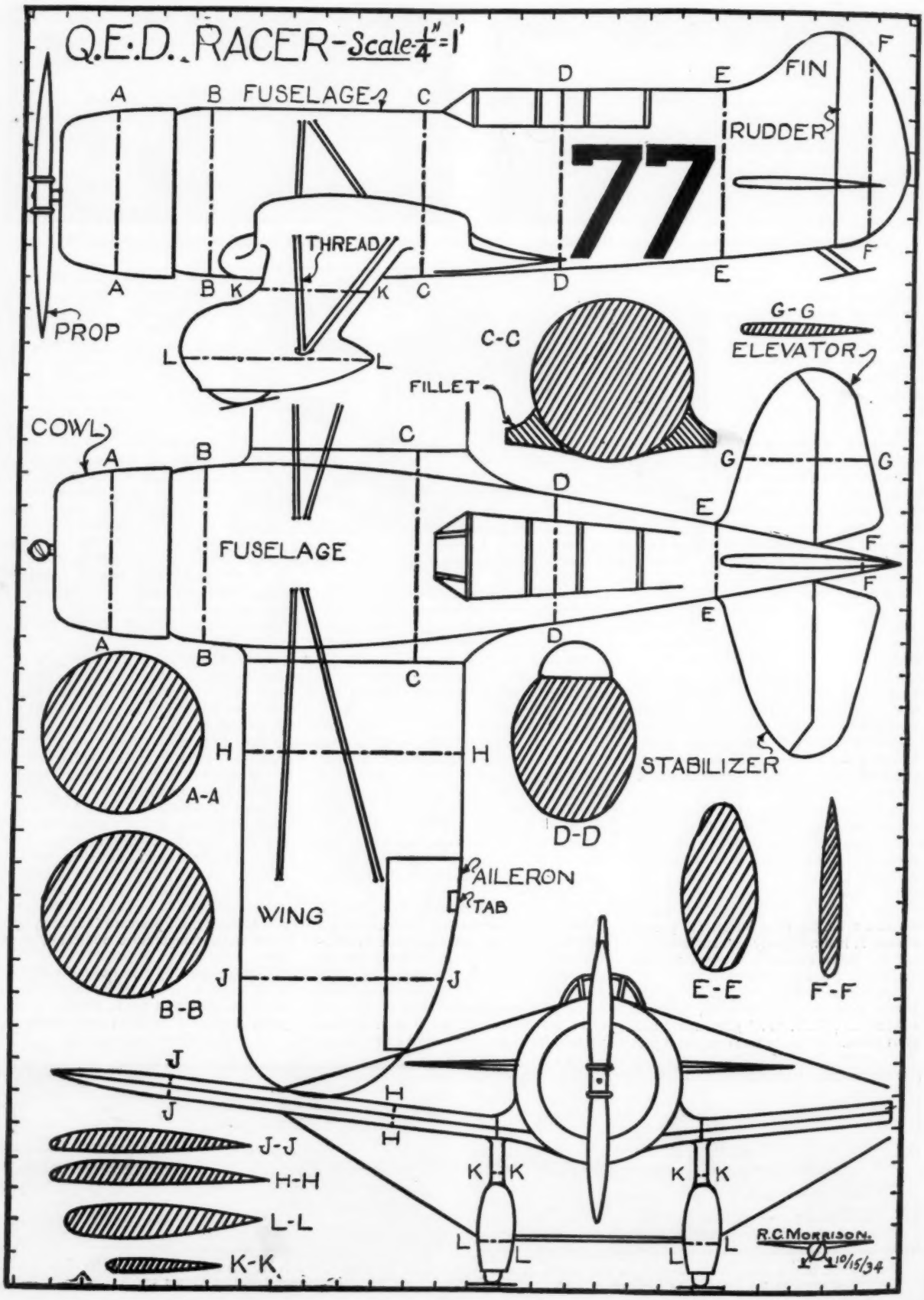
*(Continued on page 44)*



The Q.E.D. Racer, one of the largest in the world. It was entered in the London to Melbourne Race



The Wittman Oshkosh III was the fastest ship in its class. It was powered with a Cirrus engine


Q.E.D. RACER - Scale 1/4" = 1'
77
FUSELAGE
FIN
RUDDER
THREAD
PROP
C-C
FILLET
G-G
ELEVATOR
COWL
FUSELAGE
STABILIZER
A-A
D-D
WING
AILERON
TAB
B-B
E-E
F-F
J-J
H-H
L-L
K-K
R.C. MORRISON
10/15/34

# The Aerodynamic Design of the Model Plane

Article No. 35

Chapter No. 4

## A Comparison of the Energy Output of Lubricated Rubber Motors of Various Qualities and Strand Sizes

By CHARLES HAMPSON GRANT

WHAT effect has the quality, number of strands and size of the rubber of a motor upon its power output? In our last instalment, we discussed the effect of these various factors when no lubricant was used on the rubber. Now let us see what results are obtained when the rubber is well lubricated and wound without being stretched.

There are several lubricants that can be used. In the early days of model building, glycerine was used almost universally. In the last few years practically every substance has been tried that anyone might think would act as a good lubricant. Castor oil is unusually fine though this material shortens the life of the rubber. An unusually fine lubricant is a mixture of glycerine and liquid green soap. It is inexpensive and easy to make; also it does not shorten the life of the rubber to any extent. In these tests, M.R.L. commercial lubricant was used. This information is given because it is probable that slightly different results would be obtained with various kinds of lubricants.

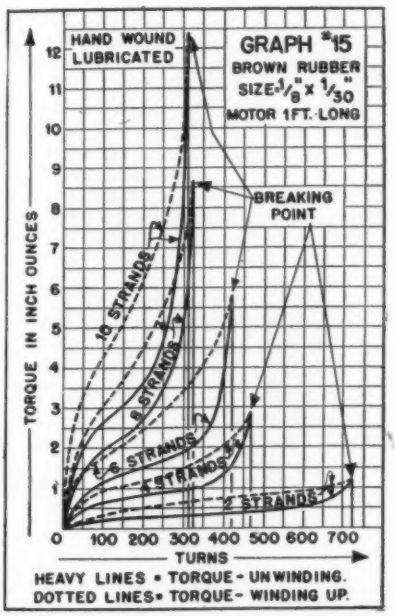
As was stated in the article last month, there have been many arguments as to the relative merits of *brown* and *black* rubber. In the tests of unlubricated rubber, black rubber proved to be slightly superior to the brown variety in almost every case where various sizes and number of strands of rubber were considered. Now, however, we have better news for the adherents of brown rubber, for when a lubricant is used, brown rubber delivers more energy in practically all cases. Let us consider the charts and compare the results which they show.

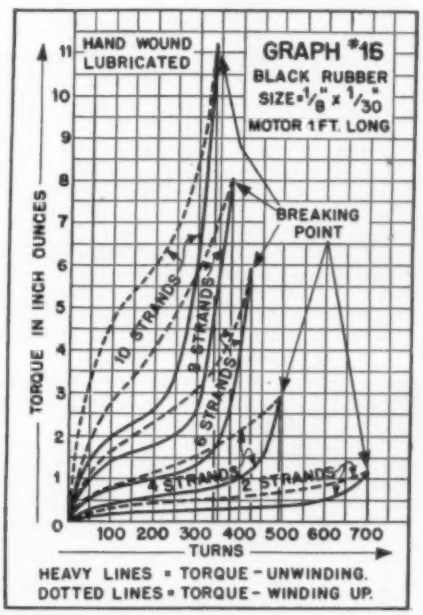
### Brown vs. Black Rubber

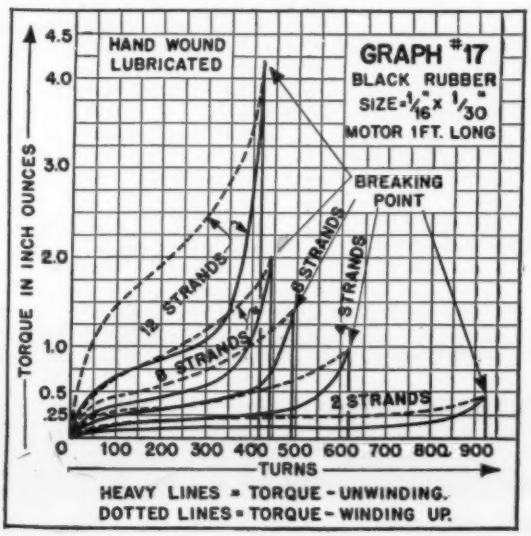
In charts No. 15 and No. 16 are shown the results of tests with brown and black rubber motors respectively. The dotted lines show how the torque increases as the number of turns in the motor increase, when the motor is being wound up. The heavy lines show how the torque changes when the motor is unwinding. We are chiefly concerned with the latter case because it indicates the power delivered to the propeller when the plane is in flight.

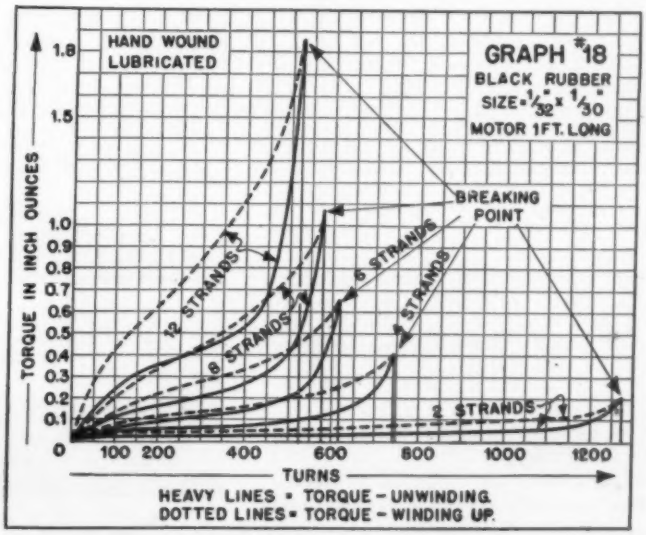
Upon comparing the maximum torque of black and brown rubber motors of various numbers of strands, we can see that the brown rubber motors of ten and eight strands give larger values than the black. However, the maximum torque is about the same for both black and brown rubber in motors of six, four and two strands. Though the torque delivered by brown

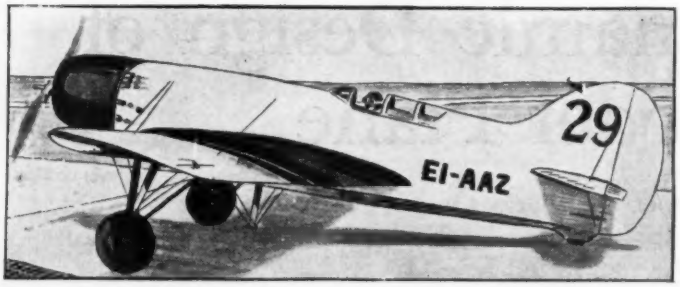
*(Continued on page 38)*



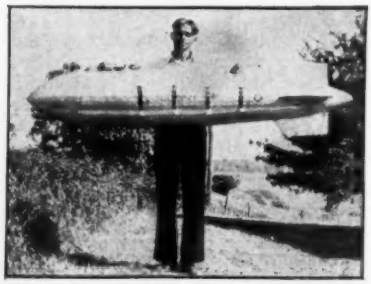






The Bellanca Racer, "Irish Swoop," drawn by Harland C. Wood

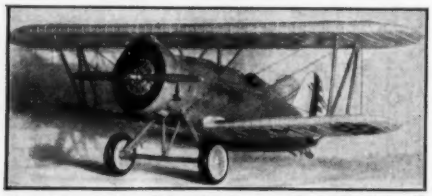
# AIR-WAYS
## HERE AND THERE

### What Readers Are Doing to Increase Their Knowledge of Aviation in All Parts of the World. Send Pictures and Details of Your Experiments



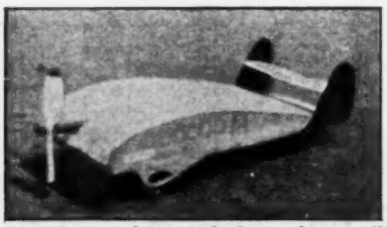
Pict. No. 1. An eight foot detail model of the Akron and its builder, Richard Scott

Pict. No. 3. A racer built from a crashed plane, by Capt. Carr, ex-war pilot



Pict. No. 6. A solid scale Boeing P-12-E with all details by F. S. Slaughter

Pict. No. 4. (Above) Leon Kubinski and Gilbert Barnhart study aerodynamics by flying gliders at Elmira, N. Y. (Right) One of their gliders in flight



Pict. No. 7. A flying turtle that performs well by Bob Brott

WE KNOW that many builders are anxiously awaiting news of the ANNUAL EASTERN STATES INDOOR MODEL CONTEST. This Contest will be held on the 27th or 28th of December in the vicinity of New York. At the present time we have been unable to definitely locate a place which is suitable for flights which are customarily made by present day contest models. Therefore, we request all those who wish to enter this contest to write to this office, 551 Fifth Avenue, New York City, attention of the editor, for full information and application blanks.

The following events will be held: Duration, Stick Model Hand-launched, Class C; Duration, Fuselage Model R. O. G., Class C; Duration, Stick Model R. O. W., Gliders, Hand-launched, Class A. The high point winner of the contest will be awarded the UNIVERSAL MODEL AIRPLANE NEWS Annual Trophy. Trophies, medals and other prizes will be awarded for the first five places in each event.

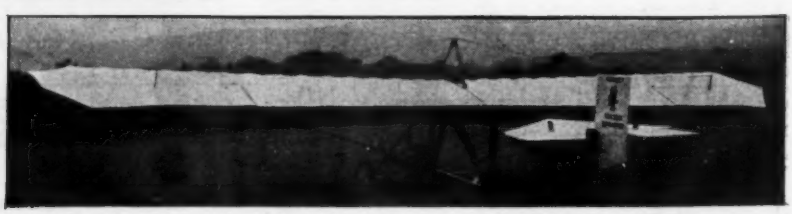
Get busy with your latest ideas on indoor models. We want to lower some of the existing records. In past years contestants have come from all over the East for this contest, so that in 1934, with model airplane activity increasing, a large attendance is expected.

Many new and unusual airplanes have come into prominence during recent months. It is customary for model builders to make great haste in securing specifications for such machines in order to satisfy their constant desire to build models which are up to date. Mr. Harland C. Wood of Middleton, Mass., a regular artistic contributor, seems to have gotten the jump on most of the builders this month. It is he who is responsible for the excellent drawing of the Bellanca Racer, "The Irish Swoop," appearing at the head of this column. We appreciate his interest in endeavoring to keep our Air Ways column up to date.

During the last two years Richard H. Scott of Gowanda, New York, has been busy constructing an exact replica of the ill-fated Akron, which he is shown holding in picture No. 1. This model is nearly eight feet long. The framework is built up in great detail of small wood strips and covered on one side. The other side is left open in order that the detail of the framework may be examined when the model is exhibited. This is one of the finest models of a dirigible of which we have received a picture, up to the present time.

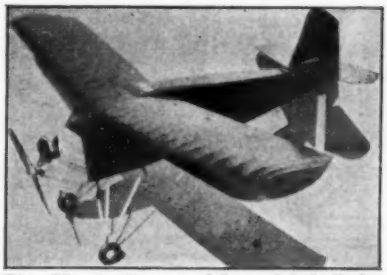
The ultimate purpose of model building is to instruct young men in aeronautics so that later in life they will be prepared for a possible career in aviation. In the case of Walter Schaefer of 308 Locust Street, Clearfield, Pa., models have performed their function well; for he, having built models for a number of years, decided that he had advanced sufficiently to enter the field of large aviation. He has always had a great desire to build a glider in which he could fly. With this idea in mind he studied diligently in order to acquire the facts and data necessary to build such a ship. He is only fifteen years old and yet he has done a remarkable job of the finished machine, as shown in picture No. 2. This is hardly

Pict. No. 8. A glider in flight built from plans in the July issue of this magazine



Pict. No. 2. A 36 foot glider built and flown by Walter Schaefer, age 15 years

an amateur's work, for it is exceedingly well done. It required four months of labor and cost sixty dollars to build. Upon its trials it took off at fifteen miles per hour, a car towing it with two hundred feet of tow line. It climbed to one hundred and fifty feet and stayed in the air for two minutes. On subsequent flights, it proved that this performance was not an accident, for it has been a consistent flier. We, in behalf of the magazine, wish to congratulate Mr. Schaefer on his accomplishment. It is not every young man of fifteen years who can build such a fine ship and have it perform in this manner. The wing span is thirty-six feet, the chord five feet, with a camber depth of nine and three-fourths inches. The total length is sixteen feet, the wing weighs sixty pounds. The total weight of the glider with its human freight is two hundred eight-five pounds.



Pict. No. 9. A successful gas job built by Julius Sobanski of the Hartford Aero Club

Pict. No. 13. M. Lartigue demonstrates his gas model at a recent contest of the Escadre de la Rose des Vents, Paris

Picture No. 3 shows another sojourn into the field of large aeronautics by one of our readers. It is a ship which has been built from the remains of a Travel-air which crashed, by Captain Carr, an ex-war pilot. Rather than be without a plane to fly, he made good use of the remains of the crashed ship. This little plane is powered with an OX-5 and is very fast. Captain Carr has won many races with it. He also used it for sky writing, which certainly proves that the Captain did an excellent job of designing and construction. We are indebted for this picture to Arthur Ledtke of 212 South Elm Street, Saginaw, Michigan. He is another of our model fans who is interested in large aviation.

At Elmira, New York, there are two young men who have become extremely interested in gliding. They caught the fever during the recent glider activities at this town. Most of the readers know that most of the soaring in this country takes place from the hills of Elmira. As these young men could not afford to take up large glider flying, they reverted to models. Picture No. 4 shows them, Leon Kubinski and Gilbert Barnhart, with their gliders on one of the hills near Elmira.

Picture No. 5 shows Kubinski's model in flight. Kubinski lives at 859 East Church Street.

In building this ship Kubinski made use of the wing and tail of his Grant Twin Tractor. He used a single rudder, however, rather than a double one. He says that he and his friend have been able to get remarkable flights from their ships and have been able to study the principles of design without the added trouble of building a propeller, motor and landing gears. The hill shown in the background of picture No. 5 is one of Elmira's main glider take-off sites.

Picture No. 5 shows a solid scale Boeing P-12-E which was built by F. S. Slaughter of 27 Rockcliffe Boulevard, Toronto 9, Ontario, Canada. It embodies great detail of construction and includes crash padding, wing walks, movable and corrugated control surfaces, ignition wires, shock absorbers, instrument board, fire extinguisher, air vents and air scoops and gun troughs. We would say that this is quite a ship.

We are always interested in receiving pictures of un-

*(Continued on Page 36)*



Pict. No. 12. A gas job by Capt. C. E. Bowden

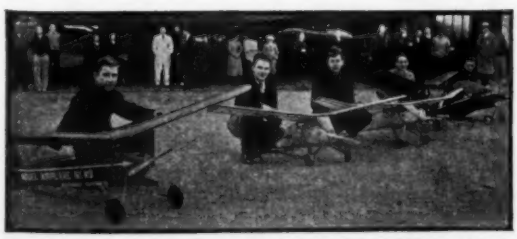
Pict. No. 15. Wm. Boulden, Irwin S. Polk, Charles Grant, B. Beeberman and Bill Brown, judges at the recent Bamberger Gas Model Contest

Pict. No. 17. Hewitt Phillips and his model Autogiro. It is built in complete detail

Pict. No. 16, Mary Walker, Bamberger Aero Club Secretary and trophies

Pict. No. 10. Not a large ship, but just a model Great Lakes Trainer posed by Jack Bruer

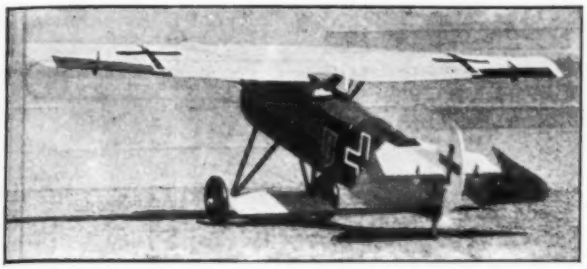
Pict. No. 11. A group of "fans" and judges at a model exhibition in Australia



Pict. No. 14. Joe Kovel, J. Condon Jr., Al Huber, Alphee LeBlanc and Frank Ehling and their gas jobs

WINDSHIELD
LEADING EDGE
LIFT BAR RIB
LIFT BAR
NOSE BEARING
1" x 1"
16 8
1" x 3"
16 16
1" x 3"
8 16
A
B
C
CC
1
2
4
1-L
2-L

PLATE 1



Details are carefully carried out. Note movable controls

The high wing gives it unusual stability

# Build and Fly the Fokker D-8

## Complete Data From Which You Can Build a Successful Model of a Famous German World War Fighter

By HARRY SHAFFER

WHEN a flying scale model is to be built, it is wise to select a type of ship which lends itself to stability. As a rule, the type which fulfills this requirement to the highest degree is a high-wing monoplane or parasol. In such ships the center of gravity is low and the wing area smaller in proportion to the tail surfaces. Then again, the monoplane type is usually superior in flying qualities to the biplane.

In looking through our list of planes and giving consideration at the same time to these factors in order to make a wise selection, we could not help being impressed with the general design of the Fokker D-8. Examining the design of this plane more carefully, we found that it had the necessary factors to the fullest degree. It is a monoplane, the wing is parasol, the center of gravity is low and the tail surfaces are quite large in proportion to the wing area. Only one drawback is apparent; the wing is located quite near the nose. This fact might make it difficult to balance the model actively for flight. However, this fault may easily be corrected by adding a little weight to the forward end of the ship. This selection was well justified after I had made the first flying model for it proved to be an excellent flyer.

Another factor which makes this ship interesting to build is the history that it made for itself during the World War. It made its appearance in the fall of 1918, though very few of these fighters actually saw combat. The planes that actually reached the front were outstanding in their ability to cope with Allied machines. It was powered with a 110 h.p. Oberursel rotary motor which gave the ship a speed of approximately 115 m.p.h. Like many German ships, this plane was ahead of its time as regards its general design. The wings were cantilever without any brace wires.

Since the World War the trend of development has progressed continuously toward this type of plane. The Douglas Transport, Boeing model 247 and other similar ships are good examples.

Before trying to construct the model, it is wise to look over the plans carefully and familiarize yourself with the details of construction. Do not start until you have a clear picture in your mind of the entire ship. A great deal of material has been wasted by such procedure. After you feel that you understand the plans thoroughly, gather all the necessary material together and commence your work.

The finished model in full flight provides a real thrill

### Fuselage

Plates No. 1 and 2, giving the side view, are used to construct the sides of this model. By placing the drawing over a board and using pins, the longerons are thus held in place. Both sides of the fuselage are made at one time, thus assuring them of being the same.

The vertical braces are now cut and placed in by gluing the bottom one first and then putting the top ones in and gluing them. When the two sides are completely dry, separate and begin to glue the cross braces starting at the front of the model. This makes the frame of the fuselage.

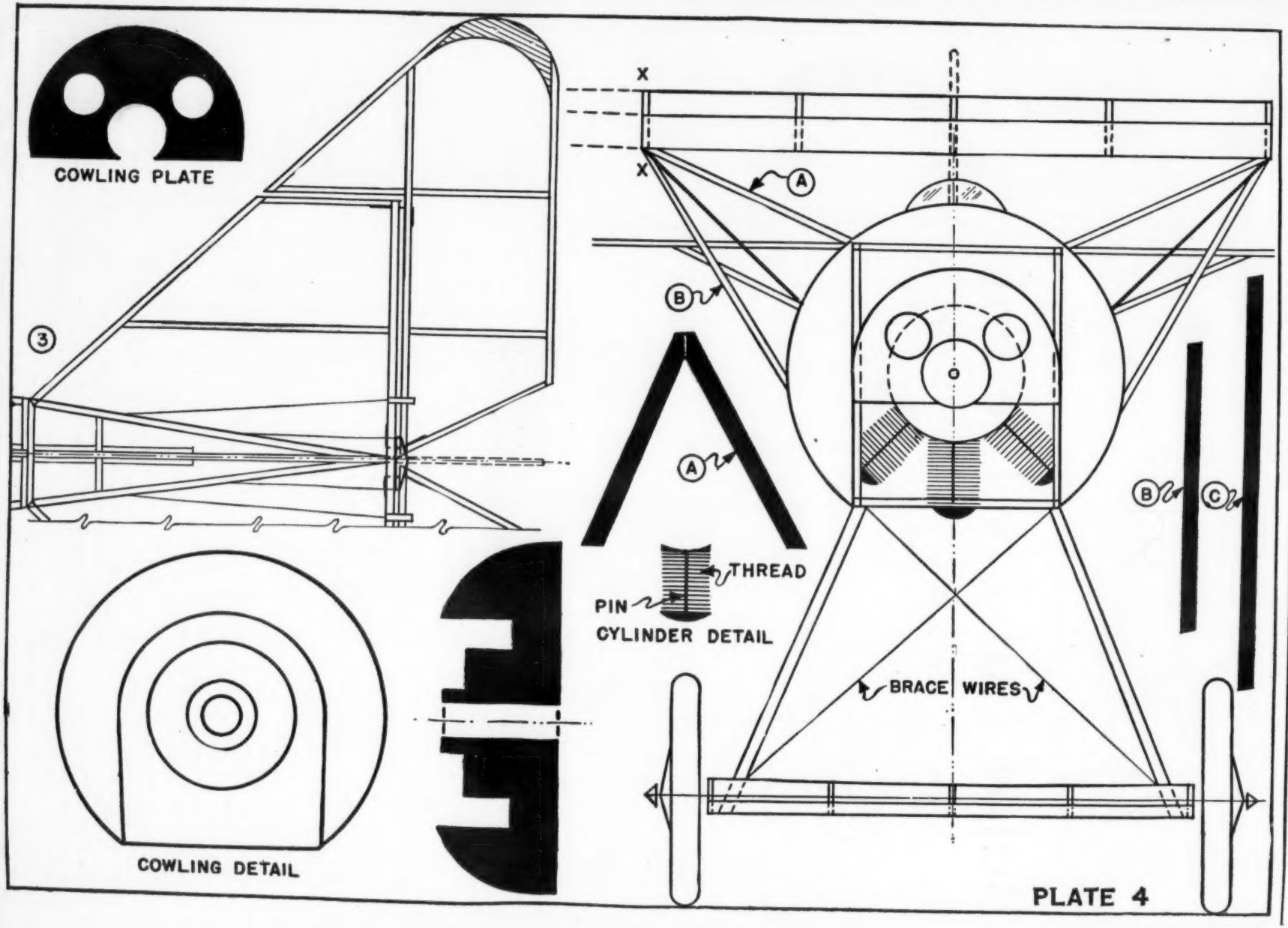
We must next cut the bulkheads which are found on plate 1. These are made from 1/16″ flat balsa, notched and glued in their proper places. The cowling must now be made. This will have to be carved or made on a lathe, the latter being the best way. The drawing on plate 3 shows the exact shape. Take the best of care in making the cowling, the point where the nose button joins the cowling is rather thin, thus requiring much care in turning. After it is completely shaped, sand smooth with very fine sandpaper and give about three coats of banana oil. This when doped will dry with a bright luster.

The inside of the cowling is painted black and then the cylinders are made, painted and glued in place. This completes the cowling. Now that the cowling is made, glue to front of fuselage and the stringers are now glued in place. The motor stick is glued in place; (Note the 1/16″ x ⅛″ support); the rear hook being placed on the motor stick before being glued in the fuselage. The cockpit is built up from 1/16″ flat balsa. Give the fuselage a light sanding so as to secure a smooth covering job.

Cover all of the straight surfaces first, using banana oil as adhesive, taking a small strip at a time. The curved parts of the fuselage are covered now taking them in small sections also. After the fuselage is covered, spray lightly with water. An insect spray works very well, and let it dry. As soon as it is dry, give it two coats of dope. Any of the leading model airplane supply houses handle a good grade of dopes. In the model pictured it is colored red fuselage with cream wings and black details. The dark fuselage and light wing color combination seems to be as attractive as any two color combination.

After the two coats of dope are applied, start on the details of the fuselage. The steps and handles are made of No. 12 music wire and glued in place. The breather pipe, which is made from 1/16″ square balsa, is colored black and glued in place and the shell ejector chute, also made of 1/16″ square balsa, is colored black and glued in place. The cockpit padding is cut from 1/16″ flat balsa, colored black and glued in place. In gluing this, be careful not to drop any glue on the paper covering or it will draw it, thus

*(Continued on page 30)*


COWLING PLATE
3
X
X
A
B
A
THREAD
PIN
CYLINDER DETAIL
B
C
BRACE WIRES
COWLING DETAIL
PLATE 4

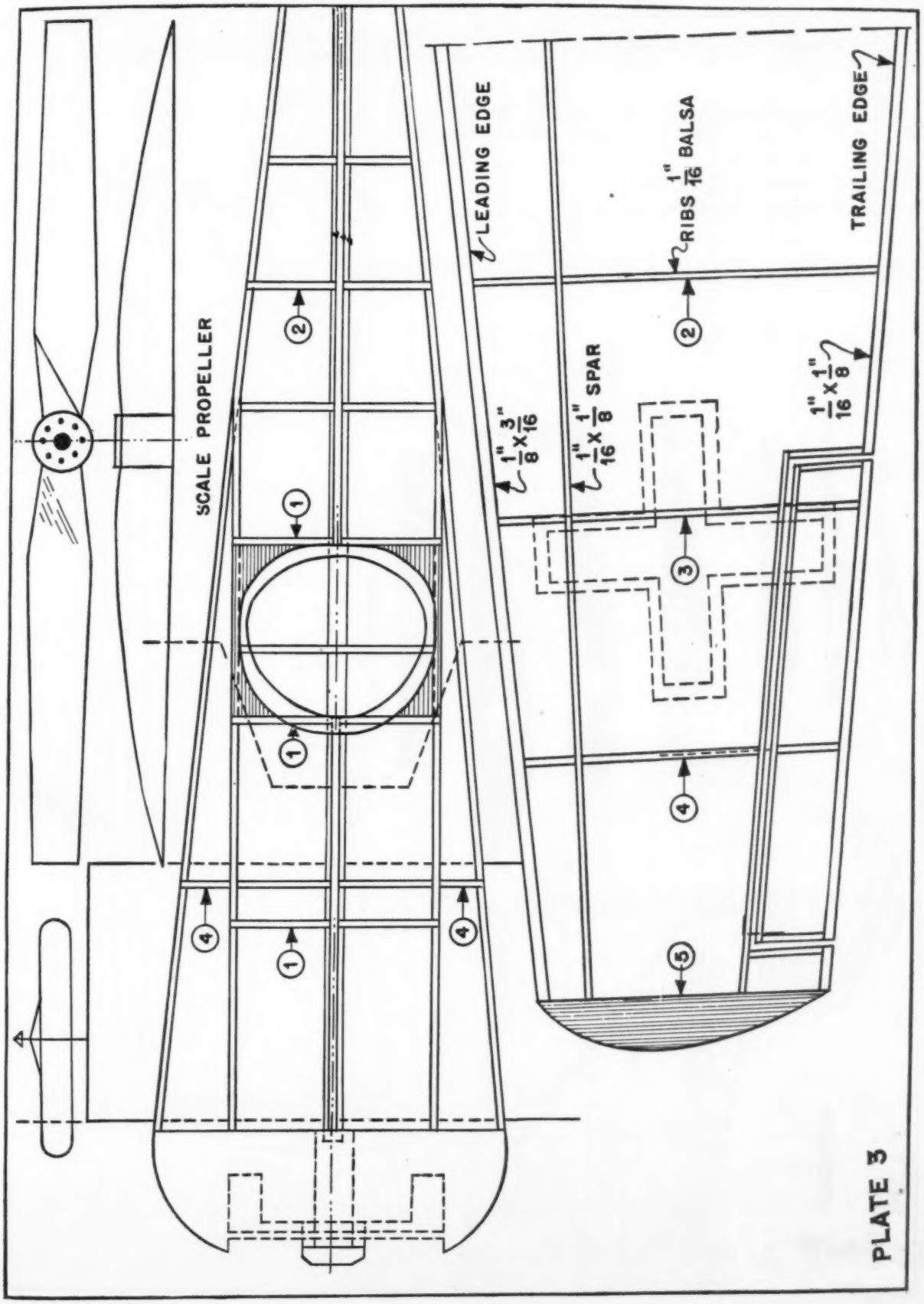
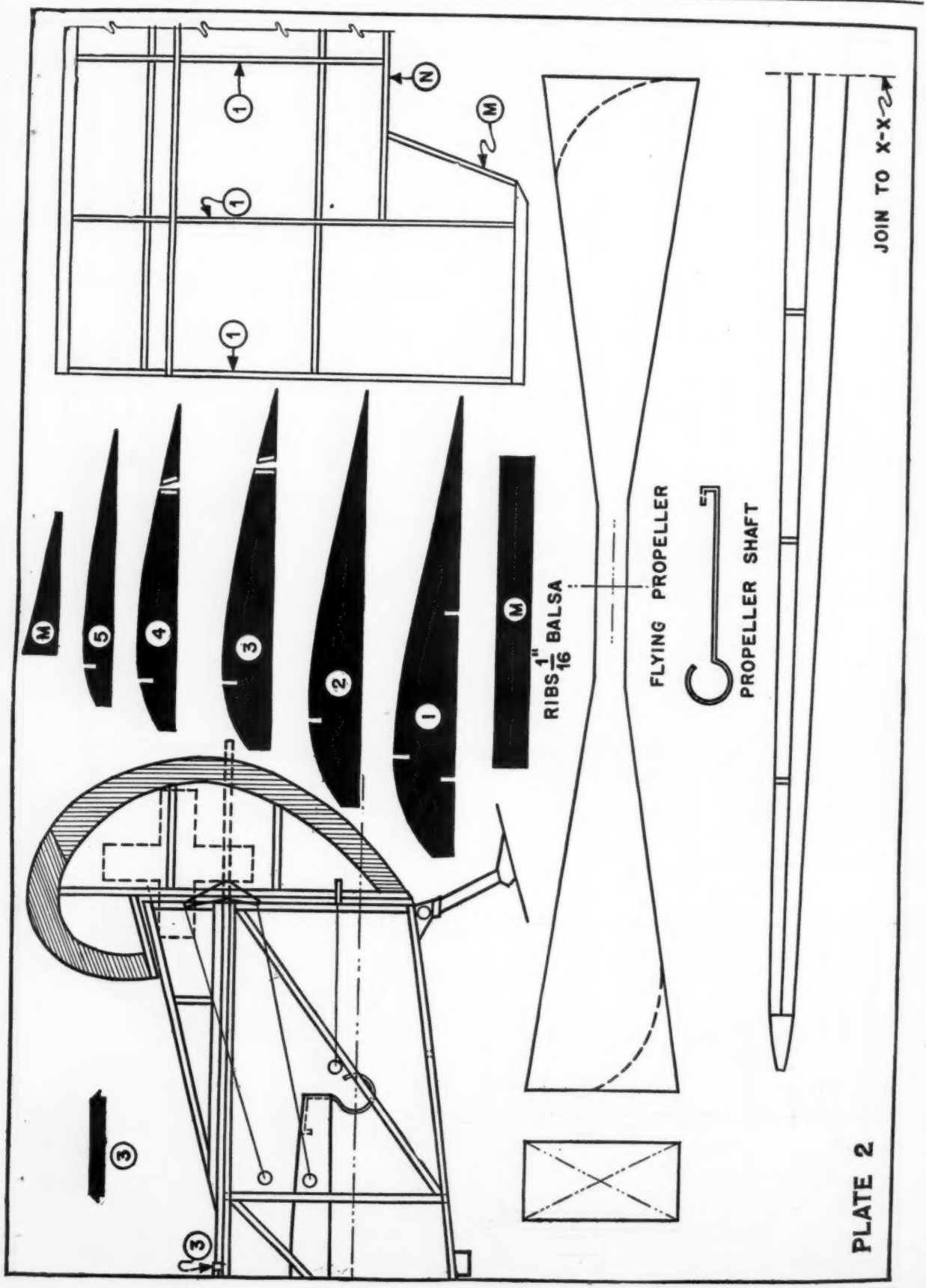

SCALE PROPELLER
LEADING EDGE
RIBS 1" 1/16 BALSA
TRAILING EDGE
1" 3/8 X 3/16
1" 1/16 X 1" 8
1" 1/16 X 1" 8
1
2
3
4
5

PLATE 3


N
M
1
1
1
M
5
4
3
2
1
M
RIBS 1/16" BALSA
FLYING PROPELLER
PROPELLER SHAFT
JOIN TO X-X
3
3
PLATE 2

# Aviation Advisory Board

Conducted by
**CHARLES HAMPSON GRANT**
Chairman of the Board
Formerly of
The Technical Section, Air Service, U. S. Army

OUR readers have sent us the usual large volume of puzzling questions this month. We have selected a few which we feel will be of general interest, as follows:

C. L. Chapman of 734 Hill Sreet, Atlanta, Georgia, is evidently a World War aviation fan. Here are several questions he asks:

*Question:* Were there any Frenchmen in the Lafayette Escadrille?

*Answer:* There were Frenchmen in this unit. However, it was composed mostly of Americans.

*Question:* How many words a minute should an observer be able to send by Morse code?

*Answer:* Approximately forty to fifty words a minute.

*Question:* What was the best German ship of 1915, 1916, 1917, 1918?

*Answer:* This question is most ambiguous. What does Mr. Chapman mean by "best"? "Best" may be used only in the case where a ship attains a definite, predetermined purpose to a high degree. Is Mr. Chapman referring to scouting, bombing, photographing, reconnaissance, or just what? During the first part of the War, the Fokker planes dominated other makes. During '17 and '18, the Albatros fighters were outstanding, together with the Fokker D-7.

*Question:* Were "archies" used for defense only?

*Answer:* The answer to this question depends upon what Chapman means by "defense." "Archies" were not moved around to various positions at extremely short notice to engage in an attack. They went into action when any enemy airplane came into range; whether the airplane was attacking or running away. An idea of their effectiveness may be derived from the fact that statistics show that "archies" made only one hit in eight thousand.

*Question:* Why is it impossible to tell an airplane's speed in miles per hour?

*Answer:* We did not know that it was impossible to determine its speed in this manner. Just what does Chapman mean by this question? We are in doubt as to what he has in mind, unless he is referring to ground speed. Air speed may be determined by an air speed indicator. Ground speed may be determined by taking the time required by the airplane to pass from one point to another point, which is a known distance from the first point. Ground speed may also be determined if the airplane is flying directly against or with a wind of known velocity. In such cases the speed of the wind is respectively subtracted and added to the air speed. The resulting ground speed is thus determined.

Here are some questions from Percy Aldridge of 104 Hunting Street, Hartford, Connecticut.

*Question:* What is the efficiency of a tandem propeller arrangement as in the Macchi-Castoldi 72 as compared with a side-by-side arrangement as in the Allan Lockheed Duo-6 Alcor?

*Answer:* We do not know the exact relative efficiencies of these two arrangements. However, it is unquestionably true that the tandem arrangement of the Macchi-Castoldi is less efficient than the side-by-side arrangement, as the rear propeller is cutting upon disturbed air. In order that the rear propeller will have the same slip as the forward propeller, the pitch on the rear one is increased an amount equal to the slip of the forward propeller.

*Question:* Where is the approximate placement of the center of gravity in a Canard or tail-first type of plane?

*Answer:* There is no definite or approximate placing of the center of gravity of such an airplane. The location of it depends entirely upon the design of the plane; that is, the relative location of surfaces and weights. On many of the Canards already built, the center of gravity is located a short distance in front of the leading edge of the rear wing.

*Question:* Are National Advisory Committee for Aeronautics publications available to the general public?

*Answer:* These publications are not given out promiscuously. Anyone sincerely interested in aviation may write to the National Advisory Committee for Aeronautics, Navy Building, Washington, D. C., and obtain circulars by paying a small fee.

Our Advisory Board would not be quite complete unless we answer some questions concerning gas model airplanes. Stanley Horn of 5929 North Talman Avenue, Chicago, Illinois, wants to know the answer to the following questions:

*Question:* In a model gas plane, the power plant of which weighs twenty ounces, what should be the minimum wing area?

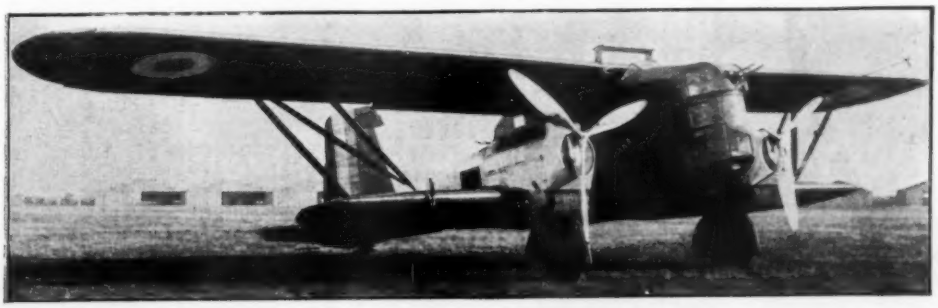
*Answer:* The amount of wing area which should be used depends entirely upon the performance that is desired. If a very fast airplane is desired, an area of three and one-half to four square feet is sufficient. However, for practical purposes and for a ship which may be entered in an endurance contest, we suggest that you use between eight and ten square feet of area.

*Question:* What wing section would be most suitable for a Monocoupe D-145, about five or six feet span?

*Answer:* We suggest the well-known Clark Y section or the U.S.A. 27.

*Question:* When the gas tank is directly behind the motor and therefore forward of the center of gravity, would not the plane tend to stall when the tank is dry? Is there any way to correct this?

*(Continued on page 47)*



**A monster French fighter and bomber, the Breguet 41M4, powered with two Hispano 12Ybrs motors of 800 h.p. each. This plane is typical of the French aviation policy of flying fortresses guarded by machine guns which fire from all angles. There are no "blind" spots**

Roscoe Turner's

## WEDELL-WILLIAMS

Another ship needing no introduction since our beloved Col. Roscoe controls it wherever she goes. The '34 Thompson Trophy winner. This fast flying model authentically colored Wedell-Williams Gold, has a span of 15½", length 16¾", and weighs 2.9 oz. Complete Kit SF-48, postfree ..... **$2.95**

# 4 More ¾" C-D's

## —just in time for Christmas!

**Make your selection NOW from this great display. Then go to your dealer. If unable to get the C-D's you want, order direct from us. We pay postage on all ¾" Kits for U. S.; for Canada, Mexico and British Isles you remit 10% extra; elsewhere 20% extra. Now you have 65 kits to select from.**

**AERONCA C-3**

True in detail, beautiful in appearance, exciting in flights. Instantaneous model "hit"! Very easy for beginners. Span 27", length 15¼", weight 1.9 oz. Red and silver. Kit SF-40..... **$2.65**

**CURTISS JN4-D**

The wartime trainer. Span 32⅜", length 20⅜", weight 2.7 oz. Now a beautiful yellow with brown trim and aileron decoration. Kit SF-4, **$3.25**

**POLISH P-6 FIGHTER**

"Filled-in" fuselage, etc. Span 25⅛", length 17⅛", weight 2.5 oz. All silver. Kit SF-6, ..... **$2.95**

**HIGH-SPEED FURY**

Redesigned and beautifully striped top wing and fuselage, lettering under wings, etc. Long, fast flights. Span 22½", length 19½", weight 2.6 oz. All silver. Kit SF-20B. **$2.65**

**DH-4 BATTLEPLANE**

Famous "Flaming Coffin." Amazingly authentic. Span 31⅞", length 22¼", weight 3.9 oz. Now olive drab with black and white checkered nose and fin, white wheels. The Complete Kit SF-3..... **$3.50**

**CURTISS HELLDIVER**

Data for both Executive or Fighter types. Span 23⅝", length 16½", weight 2.7 oz. Blue and silver. Kit SF-7B ..... **$3.50**

**NAVY CURTISS F11C-2**

The ship which needs no introduction as it has already made an excellent name for itself in Navy work. This flying model is very beautifully colored the characteristic silver with gray fuselage, green tail surfaces, cowl and other trimmings, and yellow upper wing. Span 23⅛", length 16¾", weight 4.9 oz. Complete Kit SF-49 ..... **$3.75**

**Famous '30 LAIRD SOLUTION**

It was piloted to victory by the late "Speed" Holman in the Thompson Trophy Classic. Model flies like the Super-Solution—at a fast clip. Authentically colored gold wings and tail surfaces, balance black. Span 15¾", length 13½", weight 2.2 oz. Order complete kit SF-46..... **$2.50**

## C-D "DWARFS"—25c to 85c—CREATING SENSATION

**Cleveland's new Dwarf line of ½" scale models announced by popular demand made on us for C-D quality, lower priced, smaller kits. Each kit entirely complete as are all C-D models except "Dwarfs" DO NOT contain CEMENTS OR DOPES. They are exactly 2/3 the size of the ¾" scale SF models, so take descriptions given using the same design number, but the prefix, instead of being SF is D, and use 2/3 the given sizes. D-1G 65c, D-8C 65c, D-19 65c, D-20B 45c, D-23 65c, D-24 85c, D-26 35c, D-27 50c, D-29 65c, D-33 30c; D-37 75c, D-40 60c, D-41 85c, D-42 25c, D-43 85c. 10c extra for postage on each kit must be included. Watch your dealer's stock for additional numbers. Absolutely nothing else ever like them. Remember—NO LIQUIDS.**

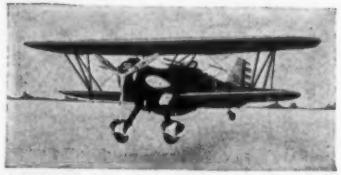
COMPLETE C-D CATALOG 5c

Use ONLY C-D Kits and Supplies

## The Big Highspeed U. S. Army MARTIN BOMBER

Claimed fastest service bomber in world. Span 53", length 33¼", weight 17 oz. Colored standard U. S. Army yellow, olive drab, details black. Novel and strong method of duplicating an almost impossible landing gear (but not retractable). Complicated fillets beautifully (and easily) duplicated. Nothing ever before like it—even our Boeing 247. Turned Balsa invisible hub wheels. By simply removing motor spars (the time-proven efficient method of multi-motor powering) model is ready for exhibition. If sold 5 or more years ago, would easily command at least $20.00. Complete printed-out-wood (Giant) Kit SF-45, post free..... **$8.50**

Now A Real **HAWK**



We claim for this model the distinction of being the finest and most complete authentic flying model on the market today. Even exhibition models could not outclass this new beauty for external appearance —and she flies very well, too! Colored the usual yellow and olive-drab of the Army with the beautiful color marking of the Selfridge Field Squadron of its characteristic black and white; with black lettering and red striped top wing, along with the red, white and blue insignias, and the "super" authenticity, this model is taken out of the model-building class of hobby work into one of almost scientific precision duplicating. The model should make a 100% wind tunnel model. Every possible detail, wing ribs, stringers, etc., reproduced. Span 23⅝", length 16¾", weight 4.9 oz. Complete Kit SF-21B.... **$3.25**

## WEDELL-WILLIAMS

Yes, this is the '33 Cup Winner which Jimmy Wedell himself flew to victory. This model is a VERY beautiful ver-

**HOWARD RACER "IKE"**

Information on this design is supplied both as the four or two wheel "Ike" and the two wheeled "Mike." Flies and climbs beautifully. Span 15⅝", length 13⅞", weight 1.5 oz. White with black details, lettering. Kit SF-42, only.. **98c**

**BOEING P12-E**

One of the prettiest of all army fighters. An excellent flying model. Span 22½", length 15⅜", weight 3.2 oz. Colored yellow and olive drab, with beautiful red and yellow trimmings. Kit SF-8C ..... **$2.85**

**REDESIGNED LAIRD SUPER-SOLUTION**

Our famous high-speed flyer. More authentic than ever. Span 15½", length 13¼", weight 1.7 oz. Yellow and green. Kit ..... **$2.50** SF-5B .....

**SUPERMARINE S6.B**

Greatly improved model of this Schneider Trophy winner, which will R.O.W. "Filled-in," fuselage radiators and other unusual features. Span 23⅜", length overall 21⅜", weight 2.2 oz. Silver and blue. Kit **$2.50** SF-19, .....

**TRAVEL AIR MYSTERY**

Completely redesigned. Span 22", length 15⅜", weight 2.2 oz. Beautiful solid appearance. Red, black scolloping, green trim. Kit **$2.95** SF-20 ....

**Build all ¾" C-D line of Thompson Trophy Winners**

| | | |
|---|---|---|
| '29 | SF-2D.... | $2.95 |
| '30 | SF-46 .... | 2.50 |
| '31 | SF-17B.. | 1.95 |
| '32 | SF-27B.. | 2.50 |
| '33 | SF-47.... | 2.95 |
| '34 | SF-48.... | 2.95 |

**Complete Set. $15.80 The "greatest" gift for Air Race Enthusiasts.**

**VOUGHT CORSAIR V-65**

Make either of the new 2-place Corsairs (V-65 or V-80). Super detailed, extremely realistic. Embodies new Cleveland features, including new principle gray flying prop blades. Span 24", length 16¾", weight 4.2 oz. Colored blue,

Every ¾" C-D Kit Now Contains

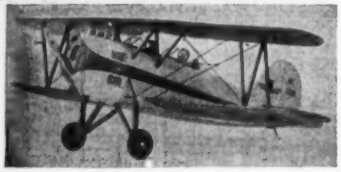
1. Pilot block for carving, with instructions. 2. Coloring for pilots. 3. Block for all detail. 4. Thread for all bracewires (mostly now silver gray). 5. Printed cut wood, not a few pieces rubber stamped, but every necessary curved, plain and cut template the finest

The Turb... now also ... plete Kit S...

FAMOUS C-D MODELS

Formerly the XP936. Very popular. Much

For those desiring to make a group gift of models besides the No. 1 Group of race planes mentioned above, the No. 2 Group of "Dwarf"



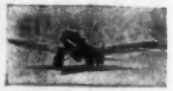
### Great Lakes Sport Trainer

One of the prettiest models available. Far easier to build than our older No. SF-1E and SF-1F. Excellent flights. Includes Cleveland's latest features and loads of details. Span 20", length 15⅛", weight 2.1 oz. Orange and cream Kit SF-1G. **$2.65**

**MONOCOUPE**
Span 24", length 15¼", weight 2.2 oz. Beautifully colored cream and orange. This design has won many first prizes for model-builders. Kit SF-28, ..... **$2.50**

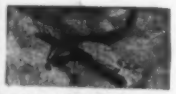
**WACO C-3**
Very popular cabin plane. Span 24⅝", length 19¼", weight 3.7 oz. Silver and red. Kit SF-37, ..... **$3.25**

**HALL RACER**
Speed flights. Span 19¼", length 13⅜", weight 2.8 oz. Red with beautiful black scalloping—nothing else ever like it. Kit SF-31, **$2.75**



**CURTISS A-8 ATTACK**
Superdetailed. Extremely realistic. A real performer. Span 33", length 24", weight 4.7 oz. Colored yellow and olive drab. Kit SF-25, .... **$3.25**

**GB SUPERSPORTSTER**
Doolittle's 1932 Thompson winner—and a beauty. Fast flights. Span 18⅛", length 13⅜", weight 2.7 oz. White, red scalloping. Kit SF-27, ..... **$2.50**



**BERLINER-JOYCE**
Graceful - appearing 2-place fighter. Excellent flights. Span 25¼", length 21", weight 3.9 oz. Yellow and olive drab. Kit SF-39, ..... **$3.50**

**LOCKHEED VEGA**
A picture for beauty—a wonder for flights. Span 30⅜", length 21", weight 3.7 oz. Colored brilliant red & cream. Kit SF-24,.. **$3.25**

**BUHL BULL PUP**
Popular lightplane. Excellent for flights, quite easy to build. Span 23⅝", length 15", weight 1.9 oz. Yellow and blue. Kit SF-26, ..... **$1.75**

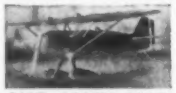
**COMPER SWIFT**
Redesigned. Excellent flights Span 18", length 13⅜", weight 1.4 oz. Beautiful green, with black fuselage design. Kit SF-33 ..... **$1.25**

**FOKKER D-8**
Claimed most efficient German World War fighter. Span 20⅝", length 14½", weight 2.9 oz. Cream and blue. Kit SF-34, ..... **$2.50**

**HEATH PARASOL**
Span 23⅛", length 12¾", weight 0.8 oz. Mostly orange, decorative black fuselage side panel. Excellent for beginners, and a "duration" flyer Kit SF-26. ..... **98c**

**BOEING 95 MAIL**
Easy for beginners. Redesigned for beauty and even greater duration than ever before. Span 33¾", length 24½", weight 3.5 oz. Blue and silver. Kit SF-32, ..... **$2.50**

**NIEUPORT 28**
Called most beautiful World War model and it certainly is. A beauty for flights, too. Span 20⅝", length 16¼", weight 2.1 oz. All silver. Kit SF-30, ..... **$2.50**



**CAPT. PAGE'S RACER**
High speed model. Span 23⅝", length 17⅝", weight 3.5 oz. Silver with red, white and blue insignia. Kit SF-44, ..... **$2.65**

**LINCOLN SPORT**
A lightplane sensation. Beginner's model. Span 15", length 12¼", weight 1 oz. Cream, black trim. Kit SF-36, ..... **98c**

*PHOTO shows a model of the big Boeing 247 built by an Akron customer from one of the first Kits we produced on this beautiful model.*

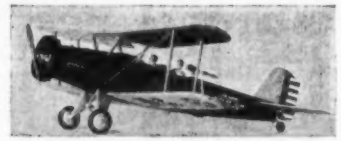
## REDESIGNED PRINTED-OUT-WOOD BOEING 247

This giant has a span of 55⅝" and a length of 38½", and is nothing less than a wizard for flights, with its two motors powerfully pulling. It is entirely gray colored and weighs 16 oz. The redesigned model has all curved wood printed-out (an enormous quantity) with data for more authentic building and appearance than heretofore, with "filled-in" fuselage, balanced controls, etc. The thoroughly engineered drawing of four large panels (17" x 44"), each contains accurate modeling information and over 16 oz. of liquids, dope, cement, etc., contained within each one of the new giant Kits. We now offer a guaranteed mailing service without the questionable express charges, so we quote you price shipped post free. Kit SF-35.... **$8.50**

**NAVY BOEING F4B-3 (or-4)**
Beautiful flying miniature of the masterful fighter now used by the Navy. Exciting to build—thrilling to fly. Capable of fairly long flights. Span 22½", length 15⅜", weight 3.2 oz. Colored silver, yellow and red. Kit SF-29..... **$2.85**

**U. S. NAVY CURTISS F9C-2**
Easy to build—and beautiful flyer. Drawings include also full information for making original 1931 Akron Fighter. Span 19", length 14⅝", weight 2.2 oz. Silver, blue, red, black details. Kit SF-22B ..... **$2.50**

THE MARK OF QUALITY



**DOUGLAS O-38 OBSERVATION**
Very beautiful and unusually well detailed model. Authentic only as "Cleveland" makes 'em! Span 30", length 22¾", weight 4.8 oz. Yellow, olive drab, black details. 2 pilot blocks. Kit SF-43..... **$3.75**

## DEALERS! — *Quick!*

Wire or write immediately (responsible established dealers only) for complete details of the "New Deal for Dealers." Liberal discounts allowed. Rush service. Hurry in order to cash in on this Christmas business before the orders are sent in to us. The new low priced Dwarf line mentioned above is especially attractive—only 25c to 85c! Think of that, for authentic C-D scale models! They're unbelievably popular with everyone. LIBERAL DISCOUNTS.

### Read Before Ordering

We have absolutely no connection with any other manufacturers so if your dealer can't supply you, send all orders to the address below. We pay postage on ¾" kits in U. S.; if you live in Canada, Mexico or British Isles, remit 10% extra; elsewhere, 20%. Special Delivery service 20c extra per kit. C.O.D.'s 25c each order, accepted only when a dollar is remitted to assure acceptance. Overpayments credited.

**C-Ds should be seen to be fully appreciated. Our Hobby Store, West 57th St. and Bridge Ave., open daily 9 A.M. to 6 P.M. except Monday and Thursday 9 A.M. to 9 P.M. and Sunday 2 to 5 P.M.Accessible from any point in Cleveland by street car (on Madison line) or driving.**

# CLEVELAND MODEL & SUPPLY CO., INC.
# 1866NA WEST 57th ST., CLEVELAND, OHIO

**THE FOKKER D-7**
An authentic steady flying beauty so colored that it looks as though it was drawn right from the ranks of one of the famous German "Flying Circuses". Wings taper beautifully, new feature control movements (not from cockpit), scale propeller, authentic spandau guns (you make all). Colored international orange, green, white, black details. Span 21⅛", length 17⅛", weight 3.5 oz. Kit No. SF-15B, .... **$2.95**

**SOPWITH SE-5**
Large beginners model. Excellent flyer. Span 20", length 15⅜", weight 1.9 oz. Natural cream color. Kit SF-9, ..... **$1.25**

**A-W QUAD FIGHTER**
Very unusual. Steady flyer. Now authentic rib spacing. Easy to build. Span 20⅞", length 18⅜", weight 2.3 oz. Red, white and blue. Kit SF-11,.. **$2.50**

**SOPWITH CAMEL**
Span 20⅞", length 14⅛", weight 1.8 oz. Snappy cream and brown fuselage, parts of wings and tail. Fuselage sides cream and brown checkered. Kit SF-10, ..... **$2.50**

**BISHOP'S NIEUPORT**
Pride of Canada's war ace, who assisted in our redesigning work. Span 19⅝", length 14", weight 1.8 oz. Silver and blue. Kit SF-12B, .... **$2.50**

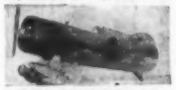
**RICKENBACKER'S SPAD XIII**
Very authentically redesigned. Span 19", length 15⅝", weight 2.5 oz. Yellow, green, black details. Kit SF-13B .... **$2.65**



**THE FOKKER D-7**
An authentic steady flying beauty so colored that it looks as though it was drawn right from the ranks of one of the famous German "Flying Circuses". Wings taper beautifully, new feature control movements (not from cockpit), scale propeller, authentic spandau guns (you make all). Colored international orange, green, white, black details. Span 21⅛", length 17⅛", weight 3.5 oz. Kit No. SF-15B, .... **$2.95**

**FOKKER TRIPLANE**
Plane of Germany's greatest ace. Von Richthofen, Span 17⅝", length 14⅛", weight 2.3 oz. Now authentically colored silver nose, white rudder and markings. Kit SF-14B, .. **$2.50**

**ALBATROS D-5**
Greatly improved, "filled in" fuselage, etc. Span 22", length 17¾", weight 2.3 oz. Dazzling coloring of yellow, orange, black. Zig-zag fuselage stripe. Kit SF-16, ..... **$2.50**



**BAYLE'S GEE-BEE**
1931 Air Race sensation. Span 17⅝", length 13", weight 2.1 oz. Yellow and black. Kit SF-17B, **$1.95**

**HOWARD "PETE"**
An easy to build Air Race model—fine flights. Span 15", length 13¼" weight 1.5 oz. All white, black details. Kit SF-18B, **$1.35**

**Formerly the XP936. Very popular. Much imitated. The most modern pursuit model of a low wing design. Authentically detailed to the tiniest gadget. Span 21¼", length 17⅛", weight 2.5 oz. Colored yellow and olive drab. Kit SF-23. A Real Buy!..... $2.50**

**For those desiring to make a group gift of models besides the No. 1 Group of race planes mentioned above, the No. 2 Group of "Dwarf" Kits, 15 models (1/2" scale) for only $10.00 is recommended. A third No. 3 Group of ¾" models, consisting of all the latest, most advanced C-D's, SF-46, 47, 48, 49 and 50, as well as 21B, $19.15. All postfree.**

# NATIONAL AERONAUTIC ASSOCIATION JUNIOR MEMBERSHIP NEWS

*Prepared by National Aeronautic Association, Washington, D. C.*

## F. A. I. Conference at Washington

THE National Aeronautic Association was host this year to the delegates from twenty countries who attended the thirty-fourth conference of the Federation Aeronautique Internationale held in Washington, October 8-11. In all, forty-two delegates took part in the deliberations and in the social events of the week. American aviation enthusiasts were thereby given the opportunity of meeting the officers and delegates of this distinguished body.

Among the delegates were many who have made aviation history or added to the scientific progress of the art. Included in the group were such names as Prince Georges Bibesco, Louis Bleriot, Wolfgang von Gronau, Tadiya Sondermayer, Edward P. Warner, and others of equal note.

The F. A. I. Gold Medal was awarded to Wiley Post for his solo flight around the world. Two silver medals were inscribed for Lieutenant Commander T. G. W. Settle and Major Chester L. Fordney in commemoration of their trip into the stratosphere. Medals were also awarded to Marshal Balbo of Italy, Rossi and Codos, the French distance fliers; and to Francesco Agello, the Italian speed flyer.

## N. A. A. Elects New Officers

THE N. A. A. annual convention was held in Washington immediately following the F. A. I. conference, on October 11-13. U. S. Senator William Gibbs McAdoo was elected president to succeed the retiring president, former Senator Hiram Bingham. Major James H. Doolittle and Mrs. Louise Thaden were elected vice president and secretary respectively. John F. Victory, long-time N. A. A. treasurer, was reelected to this post.

This convention marks the start of the thirteenth year of the Association's existence. Besides the election of new officers, many items of business were transacted and numerous committee meetings were held. The various committee chairmen delivered reports to the convention covering the progress made in American aviation during the past year. Special comment was made on the program in cooperation with the N. A. A. Committee on Model Aircraft, which called for increased activity in the encouragement of model aircraft competition.

The retiring president, Hiram Bingham, had served six years in that office. Senator McAdoo, the incoming president, is the only member of the U. S. Senate who owns his own plane and uses it constantly. It has been said that Senator McAdoo's office is in his speedy Lockheed Vega. The new president is also keenly interested in the Association's junior members and their model plane activities.

## New Model Plane Records

THE past month has seen the establishment of seven new records which were set in N. A. A. sanctioned meets.

On October 20, the N. A. A. conducted the last of its series of Lakehurst, N. J., meets. There were more than thirty entrants and although the air currents were quite pronounced in the hangar, five new records were set up.

Merrell Malley, 16, of Atlantic City, N. J., flew his Baby R. O. G. model for the astounding time of 10 minutes 56.4 seconds. "Pete" Andrews, 20, Philadelphia, established the excellent time of 20 minutes 22.8 seconds with his Class C, hand-launched stick model. A new junior record was made by 13-year-old John Whitehouse, Springfield, Mass., when he flew his Class B stick model for 13 minutes 04 seconds. The other two records were made by Philadelphia flyers. William Latour, 20, made 14 minutes 40.2 seconds with his Class B, R. O. G. stick model. Jesse Bieberman, in the open class, flew his Class B fuselage model for a new record time of 2 minutes 55 seconds.

The Association is particularly appreciative of the fine courtesy shown by the Navy Department in permitting the use of the U. S. Naval Air Station dirigible hangar at Lakehurst for these late season meets. All of those who have been fortunate enough to attend will always remember with gratitude the spirit of helpful interest shown by the station personnel. Lieutenant Commander C. E. Rosendahl, U. S. Navy, who commands the station, and all his officers and crew were constantly thoughtful of the contestants' comfort and welfare. It has been a very happy experience to have been able to fly models under such good conditions.

On November 3, up in Boston, the Jordan Marsh Junior Aviation League held an indoor meet at which two new records were made. Paul Durup, 14, hand-launched his Class B glider for a flight of 16 seconds. Bruno Marchi made a new senior record of 3 minutes 11 seconds with his Class B fuselage R. O. W. model.

The Boston boys do not have perfect conditions for their indoor contests. The effective height of their armory ceiling is only forty-five feet so that it is especially noteworthy when new records are established there.

SPRINGFIELD, Massachusetts, S. M. A. C., the very active local N. A. A. junior chapter, held an outdoor meet on Saturday, November 3. Mr. Ernest Walen, club leader, reports that the wind was too great for record breaking flights but that a number of flights went for distances in excess of a mile so that contestants and timers were given plenty of exercise.

*S. M. A. C. Members of Springfield; Mr. Walen, Director, Wearing Vest*

THE Eastern States Indoor Meet is scheduled for the latter part of Christmas week and is being sponsored by UNIVERSAL MODEL AIRPLANE NEWS. All those who are interested in entering this annual event are urged to write at once to the Editor of the magazine, Mr. Charles H. Grant, for full information. This is the regular annual Eastern States Meet and, as usual, will be well attended. Be sure to enclose return stamped and addressed envelope with your inquiry.

ST. LOUIS, Missouri, chapter, the Stix, Baer and Fuller Model Airplane Club, reports an active program of Winter events. The club's membership is growing ever larger and greater interest than ever is being shown in model planes. This club is one of the largest and most active in the country.

## Nashville Chapter

NASHVILLE, Tennessee, has been granted a junior charter in the N. A. A. Fifty-three members make up

the Nashville Model Aero Club with Mr. H. T. Carroll as club adviser. King Freeland is club president; Philip Chandler is vice president; Joe Snodgrass is secretary and Douglas Peck is treasurer. The club holds a meeting each Tuesday.

Nashville has long been an active model airplane community and it is with great pleasure that the Association welcomes the Nashville Model Aero Club. It is confidently expected that Nashville names will soon appear on the list of record holders.

### Miscellaneous Notes

Bamberger Aero Club, Newark's **N. A. A.** junior chapter, held its gasoline model meet during the last week of October. The report of this event appears elsewhere in this issue so will not be detailed here. The club's Director, Nathan Polk, has outlined an active program for the next several months, insuring the continued interest of members.

BOSTON'S Jordan Marsh Junior Aviation League held a regular N. A. A. meeting October 27 and had as guest speaker, Mr. George Mason, Massachusetts Governor for the N. A. A. He spoke of the importance and purpose of the N. A. A., its formation, and interest in the youth of today. The club members found his talk of decided interest.


NATIONAL AERONAUTIC ASSOCIATION OF U. S. A.
DUPONT CIRCLE
WASHINGTON, D. C.

I hereby make application for membership in the National Aeronautic Association as a Junior Member. I am under twenty-one years of age.

I enclose fifty cents for initiation fee and first annual dues (Use check or money order.)

Name .....
(Please print or type)

Street .....

City ..... State .....

Date of Birth .....
(Month, Day, Year)

Approved .....
(Parent sign here, if applicant is under eighteen)


## OFFICIAL MODEL AIRPLANE RECORDS

**Approved by Contest Committee of the N.A.A.**

**Through November 10, 1934**

### INDOORS

**STICK MODEL AIRPLANES, Hand-launched**

**CLASS B**

Junior: John Whitehouse ..... Springfield, Mass. ..... 13m 04s
Senior: Ralph Kummer ..... St. Louis, Missouri ..... 17m 49.8s
Open: Michael Lichstein ..... Philadelphia, Pa. ..... 14m 45.8s

**CLASS C**

Junior: John Stokes ..... Huntingdon Valley, Pa. ..... 18m. 53.4s
Senior: "Pete" Andrews ..... Philadelphia, Pa. ..... 20m 22.8s
Open: Carl Goldberg ..... Madison, Wisconsin ..... 22m 59.4s

**STICK MODEL AIRPLANES, R.O.G.**

**CLASS A**

Junior: Joseph Pruss ..... Philadelphia, Pa. ..... 10m 25s
Senior: Merrell Malley ..... Atlantic City, N. J. ..... 10m 56.4s
Open: Michael Lichstein ..... Philadelphia, Pa. ..... 8m 40s

**CLASS B**

Junior: Louis Shumsky ..... Atlantic City, New Jersey ..... 9m 15.2s
Senior: William Latour ..... Philadelphia, Pa. ..... 40m 40.2s
Open: Michael Lichstein ..... Philadelphia, Pa. ..... 11m 06s

**STICK MODEL AIRPLANES, R.O.W.**

**CLASS A**

Junior: James Shivler ..... Philadelphia, Pa. ..... 3m 41.8s
Senior: Paul Karnow ..... Philadelphia, Pa. ..... 5m 01.4s

**CLASS B**

Junior: James Mooney ..... Philadelphia, Pa. ..... 8m 37.6s
Senior: Mayhew Webster ..... Philadelphia, Pa. ..... 11m 55s

**GLIDERS, Hand-launched**

**CLASS A**

Junior: Hewitt Phillips ..... Belmont, Mass. ..... 21.6s
Senior: David B. Hecht ..... New York City ..... 34.4s

**CLASS B**

Junior: Paul Durup ..... Boston, Mass. ..... 16s
Senior: David B. Hecht ..... New York City ..... 31.6s

**CLASS C**

Junior: Stanley Congdon ..... Glen Ridge, New Jersey ..... 17s

**AUTOGIROS**

Junior: Raymond Steinbacher ..... Ridgefield, N. J. ..... 57.2s
Senior: Alton H. DuFlon, Jr. ..... Ridgefield, N. J. ..... 2m 01.2s

**FUSELAGE MODELS, R.O.G.**

**CLASS B**

Junior: Theodore Golomb ..... Philadelphia, Pa. ..... 6m 26s
Senior: Herbert Greenberg ..... Newark, New Jersey ..... 12m. 23.5s
Open: Jesse Bieberman ..... Philadelphia, Pa. ..... 2m 55s

**CLASS C**

Junior: Hyman Oslick ..... Philadelphia, Pa. ..... 12m 59.4s
Senior: Emmanuel Enderlein ..... Philadelphia, Pa. ..... 13m 24s
Open: Jesse Bieberman ..... Philadelphia, Pa. ..... 6m 31.2s

**FUSELAGE MODELS, R.O.W.**

**CLASS B**

Junior: John Stokes ..... Huntingdon Valley, Pa. ..... 3m 23s
Senior: Bruno Marchi ..... Boston, Mass. ..... 3m 11s

### OUTDOORS

**STICK MODEL AIRPLANES, Hand-launched**

**CLASS C**

Junior: Bruno D'Angelo ..... Philadelphia, Pa. ..... 8m 29.4s
Senior: Vernon Boehle ..... Indianapolis, Ind. ..... 15m 00s
Open: Bernard Collins ..... Providence, R. I. ..... 3m 23s

**CLASS D**

Junior: Fred Skafec ..... Akron, Ohio ..... 8m 21.6s
Senior: Ralph Kummer ..... St. Louis, Missouri ..... 20m 54s
Open: Frank Zaic ..... New York City ..... 1m 27s

**GLIDERS, Tow-launched**

**CLASS C**

Senior: Bob File ..... Columbus, Ohio ..... 23m 13s

**CLASS D**

Junior: Stanley Congdon ..... Glen Ridge, New Jersey ..... 45.2s
Senior: Fred Korn ..... New York City ..... 1m 16.2s

**AUTOGIROS**

Senior: Ralph Kummer ..... St. Louis, Missouri ..... 2m 06s

**FUSELAGE MODELS, R.O.G.**

**CLASS C**

Junior: Donald Mertens ..... Erie, Pennsylvania ..... 1m 44s
Senior: Russell Yungbluth ..... St. Louis, Missouri ..... 11m 35s
Open: Bernard Collins ..... Providence, R. I. ..... 2m 56s

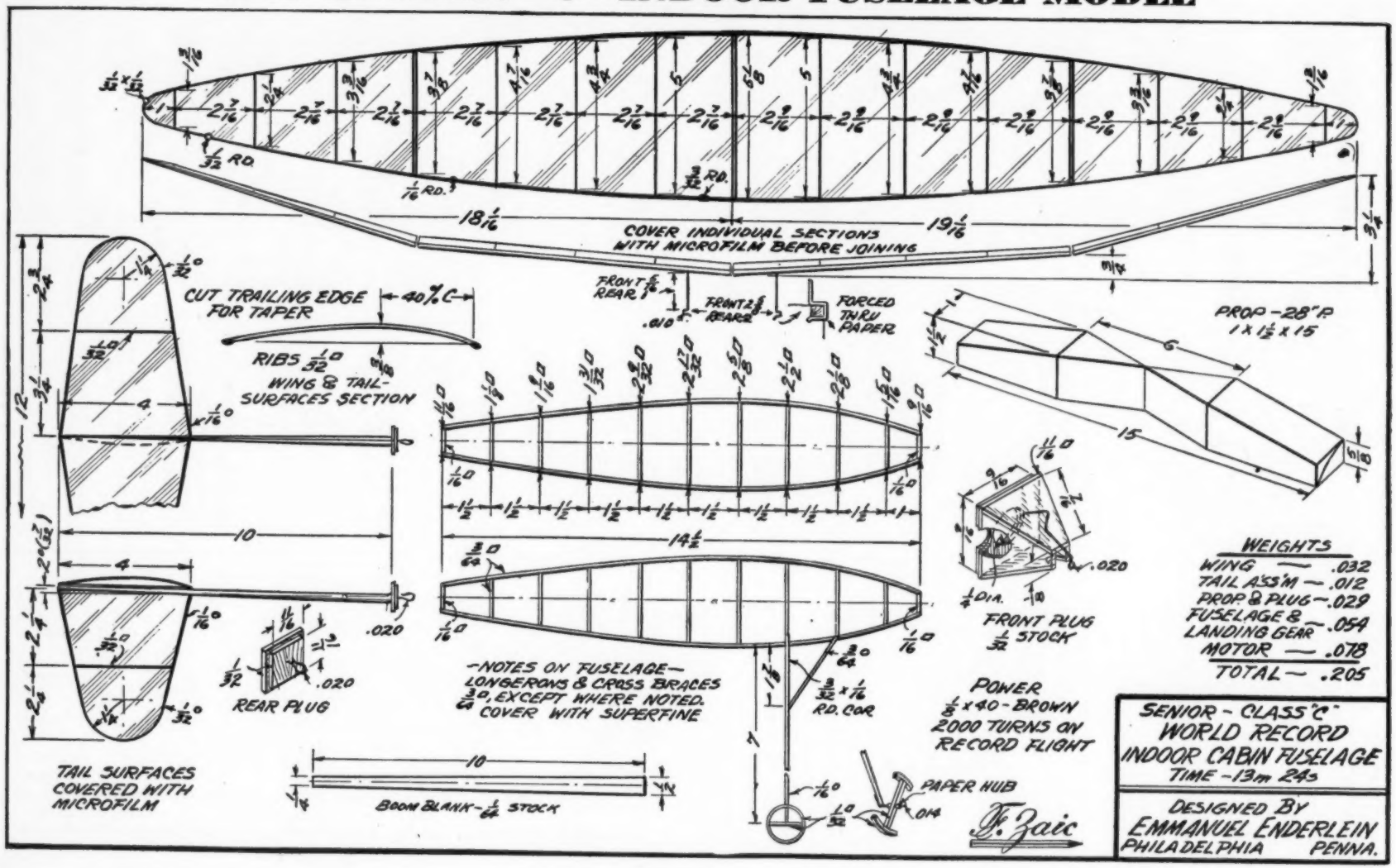
**CLASS D**

Senior: Vernon Boehle ..... Indianapolis, Ind. ..... 8m 43s
Open: Michael Lichstein ..... Philadelphia, Pa. ..... 1m 38s

**CLASS E (Gasoline Engine)**

Senior: Maxwell Bassett ..... Philadelphia, Pa. ..... 21m 57s
Open: Carl V. Carlson ..... Chicago, Illinois ..... 6m 48.5s

# N. A. A. CLASS "C" INDOOR FUSELAGE MODEL



## Half-Way Round the World on A Comet

*(Continued from Page 7)*

job, such as is seen every day on the trans-continental service in this country, piloted by Roscoe Turner, the speed ace of the American army and Clyde Pangborn, round-the-world flyer.

The American Douglas transport, another stock model loaned by the makers to the Dutch K. L. M. line. Everybody knows what this ship is like; this particular model was piloted by Parmentier and Moll of the Dutch Asiatic service. They planned to make a regular commercial run of the race, carrying six passengers and a big load of mail.

The Dutch Panderjagger transport, a three-motored type common in the K. L. M. lines, piloted by Asjes and Geysendorfer of the Holland-Java service.

The Granville special, American, a beautifully streamlined racing monoplane, driven by Jacqueline Cochrane, the famous American woman flyer, with Wesley Smith as co-pilot.

The American Lambert special, another racer, with Wright and Polando, American trans-Atlantic flyers, at the controls.

There had been one more—the big green Bellanca special, built by that American firm, for Major Fitzmaurice of Ireland. But when the airworthiness tests took place the day before the race, the rules committee told him he would have to reduce weights, and rather than sacrifice his tank capacity, he remained behind, a forlorn figure beside his big machine, as the twenty others swooped into the dawn to conquer the worst flying of the world.

What were they doing it for? A speed prize of $25,000, offered by Sir MacPhearson MacRobertson, the Australian millionaire, and the glory that would go with the prize. The first plane to arrive at Melbourne would get it. But there was also another prize, a prize that explains the presence of the other ten machines in the race, miscellaneous smaller craft that could not hope to compete with the DeH Comets or the big Boeing in speed. This was the handicap prize, $8,000, in the competition for which all machines were brought to an even basis by a complicated mathematical formula which allowed every pilot a minimum amount of time to reach Australia, in accordance with the characteristics of his plane. The minor machines, a couple of old Fairey III-Fs, a Danish-built Hawker, even an old Puss-Moth, were entered in the handicap only; the big machines in both races. Thanks to the handicap, that race was intended to be a sporting event only, a test of pilots; the speed race was to promote aviation and produce planes as well as pilots.

So those were the machines and the pilots who zoomed away from Mildenhall, five minutes apart, headed for death or glory, with one chance in twelve of winning the former and one chance in twenty of the latter.

At the end of the first day, a map of Europe stuck with pins for the locations of the contestants would have looked as though peppered with a shot-gun. The Fairey III-F was down at the very edge of the English Channel after running into a fog; there was another machine at Paris, three more in Marseilles and one in Corunna, Spain. This last was Gilman, who had gotten badly off course, run into a storm and had motor trouble, all in one day. Turner and Pangborn had stopped at Athens for gas; they found that Parmentier and Moll, with the big Douglas making wonderful time in spite of her load of passengers and mail, had landed and then taken off again, an hour ahead of them. Wright and Polando were at Rome with their Lambert, one of their cylinders dead. Parer and Hemsworth with the second Fairey Fox, were at Abbeville in the middle of France; they too had struck fog, then motor trouble. The Mollisons had been seen over Athens, well ahead of the Dutch; the other two Comets and the Panderjagger were unreported. There was one casualty—Jacqueline Cochrane's Granville. She avoided the Alps by flying in a great circle course across Germany and Hungary, but over the Hungarian plain the ship began to vibrate. It got worse and worse; the American girl finally brought the big speed plane down at Bucharest for examination and found the stabilizer was about to drop off. It was a two-day repair job, so she abandoned the race.

The next day was Sunday; by that evening all the contestants had reported somewhere, the tight knot of planes was beginning to string out and two more of the minor ships had quit. As had been expected by the general public, the Mollisons were in the lead. The last report that night was that they had swooped away from Bagdad into the dark just thirty minutes ahead of Scott and Black, in the second DeH Comet. Parmentier and Moll brought the Douglas into Bagdad three hours behind these two, stopped for a leisurely dinner and took off again just as Asjes and Geysendorfer circled above the field for the landing. Turner and Pangborn were two hours behind the Dutch pair; the rest of the contestants well behind. Wright and Polando had trouble with navigating instruments and wobbly ailerons and had landed for repairs at Athens. Cathcart Jones got lost in Syria, had to turn aside to avoid a dust-storm, and finally landed at Aleppo with one of the motors of his Comet badly overheated. The two Faireys were already pretty well out of it. Parer and Hemsworth's ship had developed a bad radiator leak and they were waiting at Abbeville in France for a replacement to be flown out from England. Gilman escaped from Corunna, but his motor went bad again and he stopped at Marseilles for an over-night repair job.

Monday was the crucial day of the race and the most exciting. The first news, early in the morning, was that the Mollisons were in trouble and had lost their lead. They had boldly flown right through the Persian mountains in the dark—a hair-raising experience—but they had no sooner reached the far side when one of their motors began to go bad and they made a forced landing at Karachi, on the Persian Gulf. When they took off from that place the retractable landing gear refused to retract, their speed dropped off as a consequence of the unforeseen drag and they made a landing for repairs at Jodhpur in India, a hundred miles short of Allahabad. Scott and Black, who had flown the Persian coast, passed them just before dawn, made the Allahabad landing, and without a pause set off again—in the lead. An hour or two behind them came Parmentier and Moll with their Douglas and six passengers, flying a planned schedule with frequent stops, just as regularly as though they made this run every day of their lives. They were making more landings than any other machine in the race, but they left Allahabad in second place.

Turner, who had also flown around the mountains, slipped past Asjes and Geysendorfer to get into third place, but he got lost in the night near Allahabad, spent a couple of hours trying to find the landing field, and dropped farther behind the two leaders. The Dutchmen in their Pander picked up a radio report that Turner had gained on them. One of their motors was not working well—defective oil-line—but they made a hurried start from Allahabad and hurried it so much that they cracked up. That finished them; and a few hours later the Mollisons also withdrew. One of the wheels of their Comet collapsed as they tried to take off from Allahabad, and when that was fixed the second motor of their ship broke down beyond repair.

Cathcart Jones had gotten his balky motor fixed and made a wonderful flight from Aleppo to Karachi, but was still far behind. Parer and Hemsworth only reached Athens; when they heard that Scott and Black were already well on the way to Singapore, they gave up the race in despair. Poor Gilman had the worst luck of all. He made Rome in the night, stopped for more motor repairs and then flew with the dawn. Over the Apennine mountains the motor went sour again; the Fairey came crashing down from 1500 feet, burst into flames and killed Gilman and his co-pilot, Baines—the only fatality of the race. That night Scott and Black came swooping out of the skies to the air field at Port Darwin on the tip of Australia, after a marvelous flight from Singapore, and Parmentier and Moll reached Pambang in Java. Nothing but a miracle could now keep them from finishing in that order.

The miracle almost, but not quite, happened. Scott and Black took off in the night from Darwin. Half an hour out the good luck that had attended them so far suddenly vanished; their left motor went dead, and though Black crawled perilously out on the wing to tinker with it in full flight, he could not get it going again. It was a desperate moment over the desert; both flyers buckled on parachutes and prepared to bail out, meanwhile radioing ahead to have the mechanical staff stand by at Charleville for emergency repairs. Their Comet limped in on one engine toward daybreak and the mechanics fell to work on it feverishly, while the tired avia-

*(Continued on Page 42)*

## Build and Fly the Fokker D-8

*(Continued from Page 19)*

forming wrinkles. The tail skid is made from 1/8" flat balsa colored black and glued in place. Make the wind shield from thin celluloid and glue in place, thus completing the fuselage.

### Landing Gear

The landing gear is made from 1/8" x 3/16" hard balsa, or bamboo strips (preferred). Make the struts as shown and streamline. They are now painted black and glued in their proper places.

### Lift Bar

The lift bar is made the same as if it were a wing. Five ribs are cut from 1/16" flat balsa and notched. The main spar (1/16" x 3/16") is pinned to the drawing and the ribs glued in their place to it. The trailing edge (1/16" x 1/8") and the leading edge (1/8" x 3/16") are now glued in place. The axle is one solid piece of No. 12 music wire. Glue it to the side of the main spar. When it is dry, give a light sanding and cover. Spray it with water and let it dry.

When dry, give two coats of cream dope and attach to the landing gear struts now on the fuselage. The wheels are 1 7/8" in diameter, turned on a lathe like the cowling and are colored with black and red discs and placed on axles. They are held on by small clots of glue. This completes the landing gear.

### Tail Surfaces

The rudder is built completely of 1/16" square and 1/16" flat balsa. Cut the curved piece, or trailing edge of the rudder from 1/16" flat balsa. Start by pinning the 1/16" square pieces to the drawing and gluing them together. The copper wire hinges are now glued in place, making the rudder movable with the fin. Sand the whole framework lightly, cover, water dope it and then give two coats of cream dope to the pin and two coats of red dope to rudder.

The stabilizer is also built completely of 1/16" square and 1/16" flat balsa. The 1/16" flat curved parts are now cut and pinned to the drawings. The 1/16" square is now cut to fit and glued in place. The copper wire hinges are now glued in place, thus making the elevators movable with the stabilizer. Sand the completed frameworks lightly, cover, water dope and give two coats of cream dope to the stabilizer and two coats of red dope to the elevators, the tail surfaces being done and glued to the fuselage in their proper places. The elevator and rudder horns, with the thread cables are now glued in place. The horns are colored black. This completes the tail surfaces or rear part of the plane.

### Wing Struts

The wing struts are made from 1/8" x 3/16" hard balsa sanded to a streamline section. The full size of these struts will be found on plate 4. After they are cut to size and streamlined, they are painted black. When they are dry, pin to the fuselage in their proper places and glue. They are now ready to receive the wing.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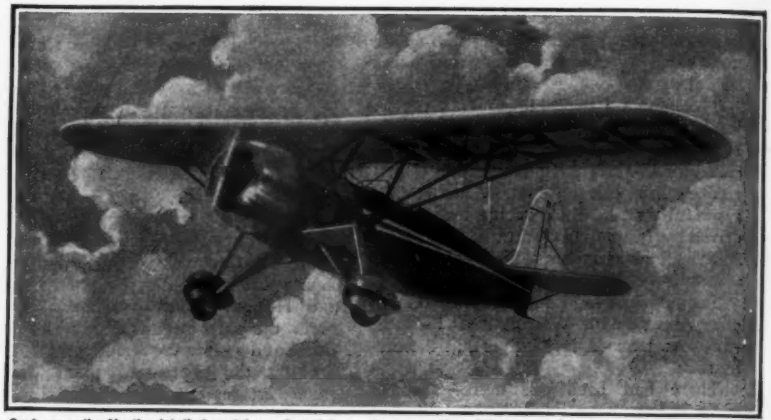

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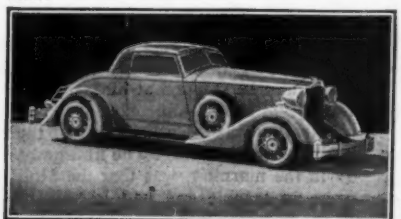

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## Wing

Make all ribs from 1/16" flat balsa. The size and number of each is shown on plate 5. One must always remember that the flying properties of a plane lie almost completely in accurate airfoil section. Therefore, cut them to the exact size shown on the drawings. The two sub-spars are pinned on the drawing and the ribs are glued in their proper places on the sub-spars. The leading edge (3/16" x 1/8") is now pinned to the drawing and glued to the center section ribs. The trailing edge (1/16" x 1/8") is done in the same manner. The main spar is now glued to the section ribs. This makes the center section with the main spar, leading and trailing edges extending from it. Crack the leading and trailing edges at the center section and pin to their places on the drawing. The solid wing tips are now made and are glued to the leading and trailing edges in the proper place.

Now, put No. 2 to No. 4 ribs in their places and then crack the main spar at the center section and glue to the notches in the ribs just added. Cut and fit main spar snug with wing tip and glue to it. The aileron spar is glued to the aileron ribs which are cut to allow it to pass through. The small sub-ribs must now be glued in place. The copper wire hinges are now added, making the ailerons movable with the wing. A slight dihedral is best for best flying results, although it is not to scale. Give the wing a light sanding, cover, water dope and give two coats of cream dope. The ailerons are given two coats of red dope. Add the aileron horns and control thread wires. The horns are colored black. The wing is pinned down over waxed paper after doping. The wing is now glued to the wing struts now on the fuselage. You can now put on the aileron control wire tubes number C-C on drawings.

## General Assembly

The propeller is carved from a hard balsa block 1¼" x 5/8" x 8" and is laid out as shown on plate 2. After it is carved, sand smooth and balance. Give two coats of banana oil and two coats of cream dope. After it is dry, assemble with three washers to the nose bearing, one washer glued to the propeller, the other to the nose button and the other being free. This plane is powered with six strands of 1/8" flat rubber which is now put in the fuselage and connected to the propeller. The iron crosses are made from black and white tissue paper and glued in their places. They are shown by dotted line on the drawings.

## Flying Instructions

The best place to fly your model is in a large field with tall grass. Give about fifty turns and hand-launch it. If it dives, raise the elevators a bit. If it climbs, lower the elevators. Do this until you get it perfectly balanced. To make it circle, bend the rudder in the way you want it to go. If these plans have been followed closely, you will have a beautiful model and a wonderful flyer. *(If the model proves to be tail heavy, weight the nose to create the proper balance).*

## Fundamentals of Model Airplane Building

*(Continued from Page 9)*

length of about 3" will serve the purpose.

When these have been cut and sandpapered smooth, the nose block is shaped from a block measuring about ¼" thick, 1⅜" wide and ⅞" long. One edge, which is the trailing one, remains straight, while the opposite one is shaped to correspond with the front edge of the side piece, as shown in the plans under "Side View." As this piece fits between the top and bottom stringers, it must be cut to allow for them. When completed, the block, struts and remaining stringer are cemented to the first side.

Note the assembly of these parts on the first side piece. The lower stringer is cut at the front end to correspond to the bottom edge of the block. It is then cemented in place. Cut and fit the struts between the top and bottom stringers, as shown in the illustration Fig. 1. When completed, cement the second side piece to the open side of this assembly. Place the assembly flat on the table and press the side in place on it. After the cement has dried, the loose ends of both sides are squeezed together and held to the pointed ends of the stringers with cement. A clip may be used to hold them until dry.

The small balsa tail skid is now cut to shape from a ⅛" thick, ⅜" wide and 1" long piece of balsa, as shown in the plans. It is cemented to the underside of the fuselage on the lower stringer 1 1/16" in from its trailing end, as shown in the plans under "Side View." While the motor cowling is not placed on the fuselage until later, it should be cut now. Cut this to the shape shown in the graph plan from a piece of sheet balsa measuring 1/32" thick, 2" wide and 3" long. Dampen it along its center and slowly bend it around to the shape shown in the graph plan under "Front View." Note this in Fig. 2. The open ends should be so bent as to come within about ⅛" of each other. When cemented in place on the fuselage these ends are then spread apart to ¼", but by making the bend a smaller one, they will more readily "spring" into position against the sides of the fuselage.

### Elevator

This is a single piece of sheet balsa cut to shape from a 1/32" thick, 3" wide and 9" long piece. Make a full-size copy of it on ¼" squares, as shown in the graph plan. Finish smooth with sandpaper. The 1/32" x ⅛" balsa strips may be added for further strength, although they are not absolutely necessary. However, if they are added, duplicate strips should be placed on *both the top and undersides* of the elevator to prevent warping either way. These are cemented in place. Cement the elevator on top of the fuselage so that its center trailing edge will be flush with the end of the top stringer. See that it is so placed that it forms right angles with the stringer and also with the trailing end of the side pieces of the fuselage.

### Rudder

This is made of two parts. The stationary fin is cut from a piece of sheet balsa measuring 1/32" thick, 2⅛" wide and 3⅛" long. Cut this to shape after making a full-size copy on paper ruled with ¼" squares, as shown in the graph plan under "Rudder." Note that its trailing and bottom edge form right angles to each other. This fin is reinforced with two 1/32" thick, ⅛" wide and 2⅛" long strips of balsa. Note these in the plan just above the rudder under "Side View." Cement these two strips, as shown on both sides of the rudder along its bottom edge.

The rudder, which is made movable, is cut from a piece of 1/32" thick, ⅞" wide and 3⅜" long. Make a full-size copy of this part on ¼" squares, as shown in the graph plan. Cut it out and carefully sandpaper it smooth. Note that this piece is held to the fin by silk strip hinges, which must be cemented on both sides of the fin and rudder. This permits it to be moved by the hand. It must also be noted that the top of the fin and the top of the rudder are flush together, while the lower portion of the rudder extends down along the trailing end of the fuselage. Attach this to the fin, which is then cemented to the top center of the elevator. Test to see that the assembly is at right angles to the elevator and parallel with the top stringer of the fuselage.

### Landing Gear

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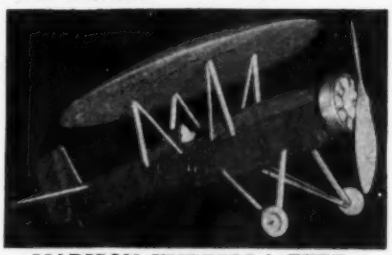

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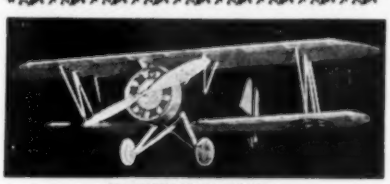

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obtained, it will prove even better. Note the form this wire is given in the plans under "Landing Gear." This can also be seen in the plans under "Side View," as well as in the photographs. Note that this is attached to the fuselage at the point where its forward strut is cemented, which is 2⅞" from the nose of the plane. See that the axles of the gear are permitted to come ¾" in front of this fuselage location. Cement the gear in place in this position, which can be seen in the plans under "Side View." Carve hard wood wheels from 5/16" wide and 1½" square blocks. Hold with washers and cement. If desired wheels of equal weight may be purchased at a supply house.

### Propeller

The propeller is carved in the usual fashion from a 13/16" x 1½" x 8" long hard balsa block, as shown in the plans. It is fitted with a No. 16 piano wire shaft bent as shown full size in the plans under "Propeller Shaft." As a further streamlining, the propeller is then fitted with a spinner or "cone," as shown in the plans under "Side View." This is carved from a ½" thick, ½" wide and ¾" long balsa block. When carved to shape, it is split into two equal halves, as shown in Fig. 3. The inner face of each one is then cut out at a slant to fit tightly around the hub portion of the propeller, as shown in the illustration. The propeller and these two parts are then assembled with cement. The propeller shaft is then fitted with a fibre washer of at least 1/16" thickness to keep its spinner free from the propeller bearing and the cowling, which is added after the motor has been assembled.

### Motor

This consists of six strands of ⅛" x 1/30" rubber. If a lubricant is to be used, Mr. Grant recommends using brown rubber, but if not, black should be used. Obtain an 84" length of either of these rubbers, as your choice may be. Tie its ends together and then loop it three times. Assemble it to the propeller shaft. An "S" hook is now bent from No. 16 piano wire, as shown full size in the plans under "S" Hook.

Thread the trailing end of the rubber over one of the hooks of this and then attach its other one over the rear hook on the fuselage. The motor cowling is now cemented in place over the fuselage with its leading edge flush with the leading end of the fuselage, as shown in the lower illustration of Fig. 2. When doing this, see that it does not extend in front of the propeller bearing as this would interfere with the turning of the propeller. Note that the bottom edge of this cowling is parallel with the bottom edge of the underside of the fuselage. Test your propeller shaft by turning for free play. Note that the front top of the cowling forms a straight line with the top of the propeller spinner.

### Wing

Cut two pieces of medium hard balsa 1/32" thick, 3" wide and 10½" long. Shape one end of each to form the wing tips, as shown in the plans under "Wing." Bring to a satin smoothness with sandpaper. Six wing ribs are cut from balsa as shown in the plans under "Wing Rib." These are given full size. Cement them to the underside of each half, as shown in the plan.

The wing tips are set at 1⅜" dihedral. Cement the center edges together with this dihedral, as shown in the plan under "Wing." Hold with pins until dry. The two wing clips are now bent from No. 9 piano wire. Note these in the plans under "Wing Clips," which are shown in full size. As can be seen in the plans under "Side View," the rear clip is ⅛" lower than the front one. These clips are so bent that they extend along the under part of the wing parallel with its edges and then turn at right angles in toward the center of the wing, where their ends are turned up and into the wood of the wing.

They are cemented in place. The double wires forming the hooks are bound with thread reinforced with a thin coat of cement, as shown in the view just above "Wing Clips" in the plans. Place the wing in position on the fuselage and hold its clips with rubber bands looped around the hooks of the clips and passed under the fuselage, as shown under the side view of the plans. This completes the model. Should more or less wing incident be required, it can be readily obtained by adding small blocks of balsa under the clips where they pass over the top stringer.

## The Development of the Fokker Fighters

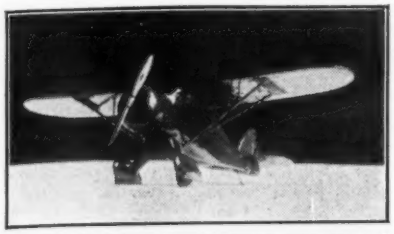
*(Continued from Page 11)*

D.V Fokker of August, 1916.

When references in War pilots' diaries dated late 1917 and the first four months of 1918 refer to flights of "Fokker biplanes," the authors of such memorable notes were referring to the Fokker D.VI. The annals of SPAD 597, one of the most colorful of Wartime squadrons, are quite complete in references to these swift moving Fokker biplanes. Thus the Fokker D.VI is given a place with the other great warplanes of 1914-1918 here, for the first time.

When in October, 1917, tests of the D.VI were completed and arrangements were made for quantity production, competitors anticipated the effect of Fokker D.VI machines allying themselves with the Fokker Triplane squadrons, and forcing them, the competitors, out of the running. It was true that pressure brought about by the Pfalz, Roland and Albatros concerns, had eliminated Fokker's chance of ever getting enough Mercedes Six motors to satisfy quantity production. But these companies had not foreseen the possibility of Fokker using the old Oberursel motors to such a sweeping advantage as he had in the D.VI. The result was that Pfalz brought out the D.IV and D.V types; Roland the D.V and D.VI; AEG entered the single seater field with the D.I, and Rumpler produced the poor D.I.

As can be seen in Figure 3, the Fokker D.VI looked every inch a fighter. The fuselage sectional drawing shown here unveils the insides of the machine. Four



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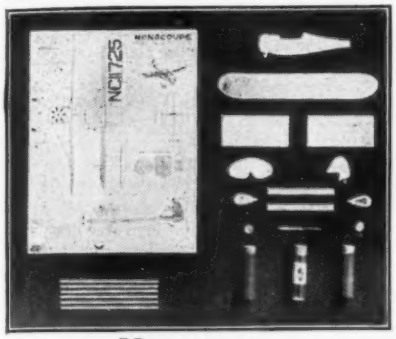
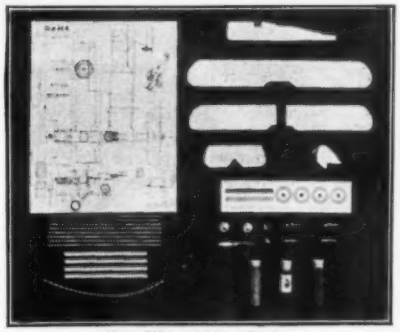


**Monocoupe**



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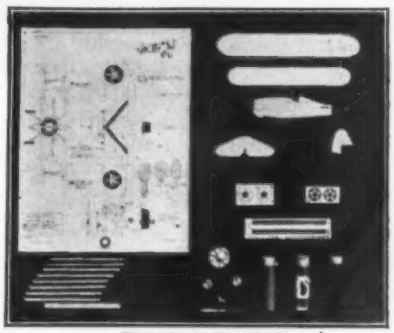

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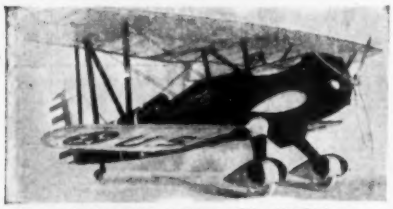

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steel tube longerons of ¾ inch diameter stock formed the skeleton of the body. Uprights of the same material, quadrants and double strands of steel wire rigidly braced the structure.

The forward ends of the longitudinals were welded to the engine bearer plate. The upper and lower longerons at this point also carried lugs for the center-section and landing gear struts. Directly behind the engine and synchronizing gear, the main petrol tank was mounted on felt-lined saddles. Fuel was carried for a full three hour patrol. An adjustable aluminum bucket type seat was welded to sliding frames. Stirrups and carrying grips were welded to the lower longeron.

Formers on top and on the sides of the fuselage carried out the roundness of the motor.

Landing gear struts were attached to lugs welded to the lower longerons. In the D.VI the axle covering was made in two pieces, front and rear, attached to a central casting which housed the axle and shock absorbing agents. Covering for the axle-wing was plywood.

Characteristic of Fokker biplane types to follow was the cellule structure of the D.VI. The upper wing, of one piece construction, carried 25 ribs mounted on two box spars. The spars in this case were not formed as one by the plywood webbing, but were independent of one another. The wing section varied in depth but the chord remained constant, the latter factor scoring for the facility of construction and repair. Balanced ailerons 7 feet, 9 inches long, were fitted in the upper wing only. Wing tips were rounded, made up of plywood strips into hollow shells.

In the lower plane 9 ribs were employed in each panel. Tips were rounded in the same manner as in the upper wing. The two spars of the lower wing were of one piece construction and were fastened to the fuselage by means of a recess in the bottom longeron structure. A covering plate streamlined the spars and fittings. The trailing edges of both upper and lower planes were of wire with the exception of the ailerons which were ash strips.

Nothing was changed in the tail assembly of the D.VI from that of the Triplane. The span of this member was 9 feet, 4 inches. The three view general arrangement drawings show the clean lines of the wings and body of the D.VI. Interplane struts were of the one piece type, welded together and attached to the wings by the ball and socket joints almost universally in use in Germany at that time. Center section struts, also of streamlined tubing, were in sets of three. The forward and rear inner struts terminated at the top longeron. In the case of the two outer parallel struts, the forward one terminated on the engine bearing plate, the rear one on top of the wing recess structure.

Armament of the D.VI consisted of two Spandau machine-guns mounted on the cowling directly in front of the pilot. An Oberursel motor of 110 h.p. supplied the power, driving a Garuda propeller of 8 feet, 9½ inches diameter.

General dimensions of the Fokker D.VI are given as follows:

Wing span upper, 25 ft. 5 in.; wing span lower, 19 ft. 10 in.; length overall, 19 ft. 6 in.; height, 9 ft. 3 in.; weights, empty, 865 lbs.; weights, loaded, 1283 lbs.; wing loading, 7.05 lbs. per square foot; power loading, 11.8 lbs. per h.p.; wing area, 184 square feet.

PERFORMANCE: High speed, 122.5 m.p.h. at 3,300 feet; landing speed, 45 m.p.h.; climb to 10,000 feet, 9 minutes; ceiling, 19,600 feet.

Pilots who flew the D.VI compared it favorably with the Fokker Triplane in matters of performance and maneuverability, but climb was sacrificed for the sake of more speed. Although the D.VI was used a great deal on the Western Front, most of its service was seen on the Eastern Front against the Italian armies.

Figure 4 shown here represents the late 1917 Junker-Fokker CL.I monoplane which, however, was not put into quantity production. This all-metal machine saw service on the Western Front in connection with the Junkers J.IV. It was fitted with a B.M.W. motor of 185 h.p. and will illustrate the advance in design and construction Fokker and Junkers carried out during their union.

While the Fokker D.VI was doing wonders in the front areas, Fokker was fighting his own battle with officialdom trying to get his supply of Mercedes Six motors. His idea of open competition, chats with the highest German aces and the final development of the most famous of all wartime airplanes, the Fokker D.VII, will be unfolded in the next installment of this series.

## Airways—Here and There

*(Continued from Page 17)*

usual ships from our readers, so Bob Brott of 609 Washington Boulevard, Seattle, Washington, has taken the trouble to accommodate us by sending us picture No. 7, showing his new and original model flying wing. It has many of the visual characteristics of a turtle; however, it seems that it does not act like one when in flight. At first it was not stable sideways, so Bob added giro blades. After that it performed exceedingly well, climbing like a rocket and landing nearly vertical. (Bob does not tell us whether the vertical landing was produced by the unretarded acceleration of gravity). However, we are sure that this proved to be an interesting experiment.

In our regular articles, entitled "Fundamentals of Model Airplane Building," we have been endeavoring to give you a series of airplanes by means of which builders may readily study the principles of flying through experiment. William Sharples of 132 Walnut Street, Wabash, Indiana, has made good use of at least one of our presentations. He built glider number three, which give such excellent results that he photographed it. It is shown in picture No. 8 while it is in flight over some wilds. He says, "It is not suspended by

wires in the air, though this impression might be produced. It took me a very short time to make it. Hand-launched on a still day I have had flights of twenty to twenty-five seconds and it has won me first place ribbons in two contests."

It seems that another young gentleman, Edward R. Guth of 304 Mildred Avenue, Syracuse, New York, also built this glider from the plans in our magazine. In effect he says that though he was skeptical about the performance, he was soon disillusioned concerning its superiority as a performer. He writes:

"July 16th. (Junior Birdmen Contest.) Made official flight of two minutes, forty-six and four-fifths seconds. Lost in clouds at four minutes, unofficial.

"August 28th. (Fort Meyer Field. National Junior Birdmen Contest). Official time, two minutes, thirteen seconds. Took second place in glider event.

"September 1st. (Syracuse State Fair Contest). Two minutes, forty-eight and four-fifths seconds, unofficial. Took glider event with fifty-five second flight.

"October 11th. (On my private testing field). Sixteen minute flight, unofficial. Followed it for six city blocks before it disappeared from sight. It was fairly clear and calm so I merely had to walk slowly to follow it. It was found on the other side of the city."

These flights were made by three different gliders of the same type. We congratulate Mr. Guth on these exceptional performances.

Carl J. Scherer and Julius Sobanski of the Hartford Aero Model Club have become gas model conscious. Picture No. 9 shows a product of their skill. On the very first flight the ship stayed up for four minutes. It is powered with a Brown Junior engine and has a six foot wing span.

"Don't let picture No. 10 fool you. Apparently it shows a Great Lake Trainer coming in for a landing. However, Jack Bruer of Route No. 3, Centralia, Washington, has become adept at the art of photographic deception, for this picture which he took of a model Great Lakes Sport Trainer is cleverly posed. It has a wing span of only twenty inches. The model itself is very well built, though this fact is hard to see from the picture.

## MODEL NEWS FROM OTHER COUNTRIES

### Australia

There has been great activity in model airplane building and flying in Australia under the skillful guidance of Mr. Ivor Freshman, who is general secretary of the Model Flying Club of Australia. Recently the Fourth Annual Model Plane Exhibition was held at Anthony Horderns. Picture No. 11 shows a group of the contestants and others interested in this event who assembled when the prizes were presented. Ray Wilson won two of the cups. Left to right on the stage are: Flight Lieut. Mulroney, Eric Kingsford Smith, R. Hammond, A. McLachlan, Justly Rawlings, H. H. Mason, K.C.; J. Clarke, A. A. Catts, C. L. Westcott, H. Dunbar, I. Freshman. In front of the table are Ray Wilson and the Hon. H. P. Fitzsimons, M.L.A


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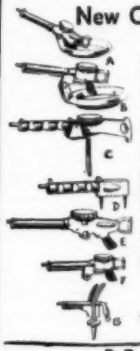

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| 4" .....30c | 4" .....35c | 2½" .....15c | 2½" .....15c |
| 4½" .....35c | 4½" .....45c | 3¼" .....20c | |
| 5" .....35c | 5" .....50c | 4" .....25c | 1" .....30c |
| 5⅝" .....40c | 5⅝" .....60c | 4½" .....25c | 4½" .....40c |
| 6¾" .....40c | 6¾" .....70c | 5" .....30c | 5" .....45c |
| 7" .....55c | 7" .....80c | 5½" .....35c | |
| | | 6" .....40c | 6" .....60c |
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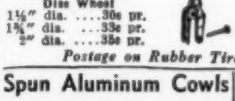

| Dia. | Drag Ring | Open Face | Closed Face |
|---|---|---|---|
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| 1½" | 18 | 18 | 18 |
| 2" | 20 | 20 | 20 |
| 3" | 28 | 28 | 28 |

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These men represent the New South Wales Aero Club, the Department of Education, the Australian Broadcasting Commission, the various air-mail services, C. C. Wakefield Ltd., and The Model Flying Club of Australia.

### Scotland

In Scotland building and flying of gas model planes has long been a hobby. One of the first builders and record holders is Captain C. E. Bowden of 33 Randolph Road, Glasgow W.1, Scotland. Picture No. 12 shows a little biplane gas model taking off. This model was built in 1932 and at that time set up a new record of seventy-one seconds. The model weighed nine pounds and was powered with an old "Wall" engine, much improved. This engine weighed three and three-quarter pounds. The hobby started in Great Britain as long ago as 1914. At that time the duration record was fifty-one seconds.

### France

We have more news this month from our French model friends of the Escadre de la Rose des Vents. On Sunday, October 7th, a large national competition of mod-

*(Continued on Page 43)*

## The Aerodynamic Design of the Model Plane

*(Continued from Page 15)*

rubber is as great or larger than that generated by black rubber. In every case it was possible to store a larger number of turns in the black rubber.

As the motors unwind, we find that the torque curve drops away more steeply for brown rubber than for black. In other words, a large amount of torque is delivered when the rubber first starts to *unwind,* in the case of black rubber. From this we can conclude that black rubber would give a longer climb during the first part of the flight. However, the black rubber does not deliver its torque for as long a period. During the middle part of the flight, the torque of black rubber is considerably less than brown rubber, as can be seen from the torque curves on graph No. 15 and No. 16.

A comparison of the total amount of work that motors of brown and black rubber will deliver is important, for upon this depends total capacity for good performance, provided the plane is designed properly in other respects. A measure of the work that a motor delivers may be had by counting the number of squares on the graphs that lie under the torque curve for any particular motor. Under the curve for ten strands of brown rubber, there are approximately forty-six squares. Under the curve for ten strands of black rubber, there are forty-one squares.

Thus, we can see that more work will be delivered by the lubricated brown rubber motor in this case. By examining the other curves, it will be apparent that this relative difference holds true in all cases. In some cases there is a greater number of squares under the torque curves for brown rubber by as much as 22%.

Thus, it is true that for any *given number of strands* brown rubber delivers more

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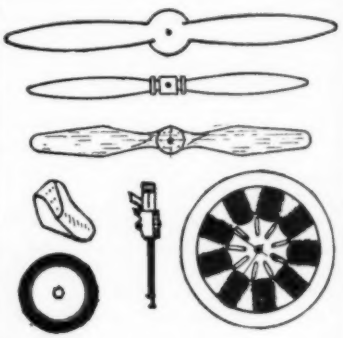

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energy than black rubber. However, we must consider the difference in weight of the two kinds of rubber. Brown rubber is about 18% heavier than black rubber. Therefore, though lubricated brown rubber gives from 14% to 22% more power than black rubber, strand for strand, its advantage is neutralized by its greater weight. From the data given here it can be readily seen that, weight for weight, brown and black rubber deliver approximately the same amount of energy, when lubricated but not stretched.

By comparing the torque curve in graph No. 16 for ten strands of black rubber, with the curve for eight strands of brown rubber in graph No. 15, it can be seen that there is very little difference in the amount of energy delivered during the last part of the unwinding of the motor. The black rubber in this case delivers more torque during the initial part of the flight. The amount of work delivered by eight strands of brown rubber per foot is represented by 36½ squares under the curve. There are 41 squares under the curve for ten strands of black rubber. When we consider that there are 46 strands of brown rubber, it can be seen that the energy delivered by the ten strands of black rubber is equivalent in amount to the energy delivered by about nine strands of brown rubber, for by interpolation, 41 is about half-way between 46 and 36½, the energy output for ten and eight strands of brown rubber respectively. The knowledge of this fact often may be of extreme importance in the application of power to contest models.

As can be seen from the graphs, the possible number of turns increase as the number of strands in the motor decrease. On the other hand the torque and amount of work delivered decrease as the number of strands decrease. The variation of these quantities is proportionally the same whether the motor is lubricated or unlubricated. Later, simple formulas will be given which will give values for turns, torque or work in various motors.

In considering the effect of various size strands on the torque we find that it is also proportionally the same with lubricated or dry rubber. Decreasing the size of the strands, increases the possible number of turns and decreases the torque, when equal cross sectional areas of rubber are used.

Now let us compare the energy output of unlubricated and lubricated rubber, of various qualities and sizes. When a lubricant is used on brown rubber, we find that the maximum torque possible is increased from 15% to 25%. This can be seen by comparison of graph No. 11 in last month's article and graph No. 15. The maximum number of turns that can be stored increases about 50% to 60%. When fewer strands are used in a motor the increase is greater than in cases where a large number of strands are used. One thing is quite noticeable, however. The average torque does not increase in the same proportion as the turns. In fact, at any corresponding period during the unwinding of the motors, the torque of the lubricated motor is less than that of the unlubricated one, except near the point of maximum number of turns. That is, if


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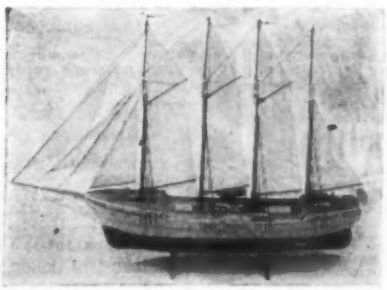

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each motor is half unwound, the unlubricated one will be delivering the most torque.

The amount of work that can be stored in lubricated brown rubber motors is about 25% greater than in unlubricated ones. This can be calculated exactly from the formulas given in last month's instalment.

In comparing graphs No. 12 and No. 16 for 1/8 x 1/30 black rubber motors, we find that the increase in the maximum number of turns possible is from 30% to 40%. There is very little increase in the maximum torque, if any. Like brown rubber, the torque resulting during the unwinding of lubricated motors is less than for the unlubricated motors. In this case the torque is about 25% to 30% less. This holds true for motors of various numbers of strands. Like brown rubber, the amount of work that can be stored is about 25% greater.

Upon examining graphs No. 13 and No. 17, the significant fact that can be noticed about the maximum number of turns is that the use of a lubricant on 1/16 x 1/30 rubber does not increase the maximum number of turns to as great an extent as in the case of larger rubber. The maximum torque for lubricated rubber is about 20% less than for dry rubber. The torque developed during the unwinding (about half unwound), is as much as 35% to 40% less in the case of the lubricated motors. However, the lubricated motor develops about 25% more energy.

In graphs No. 14 and No. 18 for 1/32 x 1/30 black rubber, a peculiar situation arises. It is apparent here that lubricant does not help matters very much. In the case of motors of eight to twelve strands there is an increase in the maximum turns of about 20%, while when lubricant is used on motors of few strands (two to six), there is actually a decrease in the maximum number of turns. Thus, it appears that in fine strand motors of few strands a lubricant only "makes matters worse."

The torque and work obtained from motors of 1/32 x 1/30 rubber is also changed very little with the application of lubricant to the rubber, except when a small number of strands are used. Then, however, the torque drops considerably. The work represented by the area under the heavy graph lines, is also much less. In other words better results will be obtained when fine strands of black rubber are used, if no lubricant is applied to the motor.

Now, what conclusions can we make from all these facts? The first thing that is apparent is that the use of a lubricant increases the energy output of brown rubber considerably, where a small number of strands are used, but is not helpful to black rubber. Though it increases the possible number of turns slightly in the case of the latter, the *torque* developed is much less in all cases. The *increase* in the amount of energy delivered is less for black rubber where few strands are used. Also, lubricant increases the maximum torque of brown rubber considerably, but has little effect on black rubber, in every case.

Another important conclusion is that the use of lubricant increases the possible


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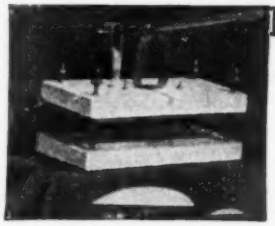

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| TORQUE FATIGUE TEST TABLE No. 3 | | | | | | | |
|---|---|---|---|---|---|---|---|
| EFFECT OF REPEATED WINDINGS ON TORQUE | | | | | | | |
| MOTOR = 8 STRANDS OF 1/8" x 1/30" LUBRICATED BROWN RUBBER | | | | | | | |
| TORQUE GIVEN IN INCH OUNCES, MOTOR UNWINDING. | | | | | | | |
| TIMES WOUND | NUMBER OF TURNS | | | | | | INCREASE IN MOTOR LENGTH |
| | 50 | 100 | 150 | 200 | 250 | 300 | |
| 1 | 1.50 | 2.00 | 2.30 | 2.70 | 3.50 | 6.5 | |
| 2 | 1.55 | 2.00 | 2.25 | 2.55 | 3.20 | 6.1 | |
| 3 | 1.55 | 2.00 | 2.25 | 2.55 | 3.20 | 5.0 | 5.7% |
| 4 | 1.50 | 2.00 | 2.25 | 2.55 | 3.20 | 5.0 | |
| 5 | 1.50 | 2.00 | 2.25 | 2.50 | 3.10 | 4.8 | |
| 6 | 1.50 | 2.00 | 2.25 | 2.50 | 3.10 | 4.6 | 8.3% |

| TORQUE FATIGUE TEST TABLE No. 4 | | | | | | | |
|---|---|---|---|---|---|---|---|
| EFFECT OF REPEATED WINDINGS ON TORQUE | | | | | | | |
| MOTOR = 8 STRANDS OF 1/8" x 1/30" LUBRICATED BLACK RUBBER | | | | | | | |
| TORQUE GIVEN IN INCH OUNCES, MOTOR UNWINDING. | | | | | | | |
| TIMES WOUND | NUMBER OF TURNS | | | | | | INCREASE IN MOTOR LENGTH |
| | 50 | 100 | 150 | 200 | 250 | 300 | |
| 1 | 1.0 | 1.35 | 1.5 | 1.77 | 2.1 | 4.90 | |
| 2 | 1.0 | 1.35 | 1.5 | 1.77 | 2.1 | 4.10 | |
| 3 | 1.0 | 1.35 | 1.5 | 1.80 | 2.0 | 3.60 | 8.7% |
| 4 | 1.0 | 1.40 | 1.5 | 1.77 | 2.1 | 3.35 | |
| 5 | 1.0 | 1.35 | 1.5 | 1.77 | 2.0 | 3.15 | |
| 6 | 1.0 | 1.35 | 1.5 | 1.80 | 2.1 | 3.10 | 9.3% |

number of turns when a large number and size of strands is used. The fewer the strands and smaller the strands used, the less beneficial effect lubricant has. A motor of very small and very few strands should not be lubricated for best results.

### Fatigue

It is interesting to note the effect of lubricant on the fatiguing qualities of both brown and black rubber. The story is told clearly by a comparison of the fatigue test tables for lubricated rubber given here and the tables for dry rubber given in last month's article. These latter tables (dry rubber), indicated that brown rubber had fatigued more than black rubber at any given number of turns except at the point of maximum winds. At 50 turns, the torque for brown rubber had dropped considerably, while there was very little change in the case of black rubber after winding it six times. At maximum turns, the drop in torque was the same in both cases.

The results given in the tables here, when lubricant was used, show that the lubricant improved the brown rubber a great deal while it had little effect on the torque delivered by the black rubber. In both cases, the drop at maximum turns was about the same while at fifty or one hundred turns the torque did not drop at all. In the case of brown rubber, the lubricant actually increased the maximum torque. Thus we see that the use of a lubricant prevents fatigue in both cases, especially in the case of brown rubber. Practically the only advantage derived from its use on black rubber is the increase in the number of turns it insures.

A good rule to follow is: Use brown rubber when a lubricant is to be applied and black rubber in other cases.

To the interested and serious-minded model fan, these tables will provide many hours of intriguing speculation and study. Many hidden facts lie within this data which will be apparent after careful consideration.

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In our last instalment, a typographical error was made which we wish to correct. On page No. 32, December issue, in the first column, there should be a (V) below the line appearing under the (N). The formula should read:: $W=2\ \Pi\ H \left(\frac{N}{V}\right)$


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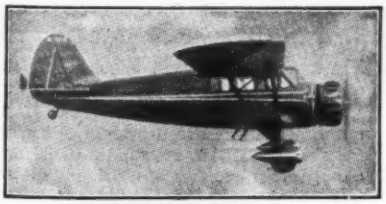

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## Half Way Round the World on a Comet

*(Continued from Page 29)*

tors, who had not slept a wink thus far, went to bed.

While they rested Parmentier and Moll dropped in at Darwin, took their time about resting, and then took off again, with all six passengers enjoying themselves very much. Turner, though he had been handicapped by having his fuel capacity cut under the rules, had gained on them. These three planes were the only ones really left in the contest, though Cathcart Jones had been making splendid work and was on his way to Singapore.

When he went to bed, Scott left orders to be called in three hours, whether the machine was ready or not. He planned a desperate try for victory on the last leg with a single motor if the second could not be fixed. It would have been a tough job taking off as the landing field had a bad cross-wind, but fortunately for him, it was not necessary. When he was pulled from his bed it was to step into a plane once more running sweetly. Scott and Black climbed aboard, took off, and three hours later were floating down to a landing at Flemington Race Course in Melbourne, while thousands of visitors cheered themselves hoarse. They were clear winners by a two-hour margin and they had shattered every existing record for long-distance flying, covering the distance from England to Australia in 2 days, 22 hours and 50 minutes, cutting the old record by more than half and covering the route with an average speed, including stops, of over 160 miles an hour.

For a time it seemed as though Turner might win second place from the Dutch. Parmentier and Moll were lost in a rainstorm above the Australian Alps, ran short on gas and had to make a forced landing in a muddy field at Albury, after dropping flares and radioing for directions. The aviation authorities sent out every auto in town to point the way to the field with illuminated headlights, but when the Dutchmen landed, the big Douglas sank clear to the hubs and it was a slow job dragging her out again, with Turner coming along at 180 miles an hour in the rear. Then one of the Boeing's oil-lines went out. Turner had to land for repairs too, and the Dutchmen got out of the mud to make second place with ease, after the most sensational run of the race, for their six passengers had enjoyed perfect comfort throughout the long run.

When the figures were all in, it was discovered that they had taken second place in the speed race.

Third place was easy for Turner and a whole day later Cathcart Jones came in. He had had a tough time of it over the tip of Australia at the end of the long jump across the Timor sea, missing his bearings in a hurricane and flying 200 miles off course. With his gas practically all gone, he was more than five miles from Darwin with nothing but uninviting rocks and still more uninviting water below. He cleverly used his last precious drops of fuel for a steep climb to 30,000 feet, then glided home to the airport in the first light of dawn, with lightning flashing all around him and a dead motor, unable to fly another inch.

The rest of the machines, long since out of it for the speed prize, but hoping to have a chance for the handicap, drizzled along in for another week. Only five of them finished at all and only one met with an accident—the last of the special speed planes, Wright and Polando's American Lambert. They had trouble all along, but touched the peak of bad luck when they had to make a forced landing in Persia, and were thrown in jail as possible spies!

What does this race mean to aviation as a whole? If the results show anything, it is the tremendous improvement in the quality of machines and pilots since the last big race of the kind—the unfortunate Dole race from San Francisco to Hawaii, which cost the lives of so many daring pilots. And the improvement is especially marked in the big transport planes, the Boeing, Douglas and Pander. Scott and Black made a splendid flight and won a splendid victory with one of the fast DeHavilland Comets; Cathcart Jones brought another one in through difficulties that would have

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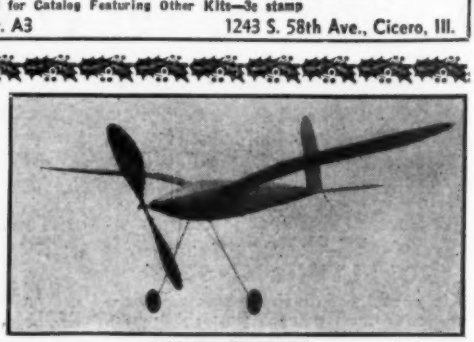

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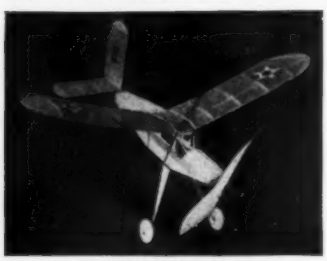

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floored most aviators. But the rest of the racing machines—the other Comet, the two Faireys, the Lambert, the Granville and the Bellanca, never even finished the race, while the big transport ships just boomed along and did exactly what they set out to do. The K. L. M. officials were so impressed that they ordered ten more Douglases like the one that had made the race and a Melbourne syndicate made a huge offer for the third place Boeing. And what that all comes to is this—that aviation has ceased to be a sport and become a regular commercial enterprise, in which commercial machines do the best over the long haul, and are capable of meeting any flying conditions whatever.

### Airways—Here and There

*(Continued from Page 38)*

els was held near Paris. Flights of more than two minutes were made. The time of many of the contestants ran over one and one-half minutes. One of the interesting features of the contest was the demonstration of gasoline model planes which was given by M. Lartigue.

Picture Number 13 shows the gasoline motor airplane with Mr. Lartigue, the designer, on the left. The model is being prepared for a flight. Flights of seventy-eight seconds and two minutes and thirty seconds have been made with this ship. Equally fine flights were made by M. Riout with one of his ships. Both these gentlemen are members of the Escadre de la Rose des Vents. We are indeed pleased to have news from our friends in France and trust that in the future a contest may be arranged in which various countries may participate by sending contestants in person to the meet instead of merely sending the model which some strange builder has to fly.

## CLUB NEWS

### First All Gas Model Plane Meet

One of the most interesting events of the season was the Gas Model Contest held Saturday, October 27th, at Caldwell-Wright Airport and sponsored by the Bamberger Aero Club. This contest was open to all comers and was operated under the National Aeronautic Association rules and with its sanction. It was the first all gas model contest ever held in this country. Blowy and gusty weather prevented unusual times; however, about twenty contestants entered their planes and some excellent flights resulted. Picture Number 14 shows a line up of some of the planes. Joe Kovel is at the extreme left.

Among the well known gas model builders was Joseph Kovel, Jimmie Condon and Alfred Huber.

Among the well known guests at the meet were Mr. Irwin S. Polk, of the Junior Birdmen; Mr. Charles H. Grant, Editor of the MODEL AIRPLANE NEWS; Mr. Beeberman, Field Director of the P. M. A. A.; Mr. Bill Brown and Mr. Robertson of Philadelphia, who perfected the Brown Junior Motor. (These two gentlemen deserve thanks from all contestants for the valuable assistance they gave in tuning all the motors). Picture Number 15 shows some of these gentlemen.

The first model to take off was that of Mathew Kanin, 3288 Gaul Street, Philadelphia. His ship made a perfect take-off and gained altitude rapidly, when the wind took it and began carrying it to parts unknown. Cars and motorcycles started and took to the highway in pursuit but could not locate the plane after one hour's search. The time, when the model disappeared, was 5 min. 25 sec. Mr. Polk, who conducted the meet, arranged with Mr. Earl S. Eckel, owner of a pitcairn autogiro, to take Mr. Beeberman up and see if they could locate the ship from the air. They were successful and the model was retrieved undamaged.

The second good flight was made by Joseph Kovel of 746 Rockaway Avenue, Brooklyn, New York, whose ten foot wingspan job was considered the "perfect" job by experts on the field. Joe's job gained altitude slowly but surely and reached an approximate ceiling of 1000 feet. It was up 6 min. 45 sec. when it disappeared. Unfortunately the motor stopped on this flight when only half the gas in the tank had been used up.

Confidence must be "everything" in the life of George Smith, 398 Seventh Avenue, Brooklyn, New York. He claimed that

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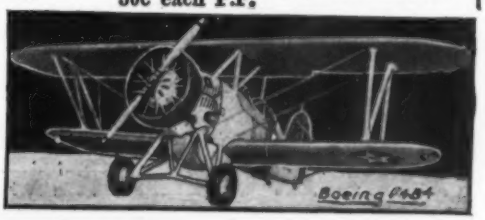

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| 10" | D. H. 4 ..... 2.75 | 7¾" | Fokker D. 7..... 2.15 |
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| 6½" | S. E. 5..... 2.15 | 6¾" | Kondor Ellia... 2.15 |
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| 6½" | Spad ..... 2.15 | 11" | L. V. G. ..... 3.25 |
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**CHRISTIE BATLAS**

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he could do 10 minutes on half of the allotted supply of gasoline and would not accept more from the judges. His motor only needed one turn and it was off. A good take-off and perfect climb got it the perfect ceiling and it was on its way to win first prize. A Wright Junior plane took off the field and tailed the model for 9 min., 55 sec. Smith made good his boast.

Crack-ups and motor trouble were plentiful and the large crowd of spectators got plenty of thrills in watching Emanuel Radoff's job take off, suddenly turn and crash into a brand new Waco, tearing a big hole in the wing of the airplane and ruining Radoff's job completely.

The contest was conducted by Nathan Polk, Director of the Bamberger Aero Club. Judges were Mr. Beeberman, Irwin S. Polk, Charles H. Grant, Editor of UNIVERSAL MODEL AIRPLANE NEWS, Walter Lambert. Miss Mary Walker, secretary of the Bamberger Club, was recorder. She is shown in picture No. 16, with first and second place trophies.

### Jordan's Junior Aviation League

As usual, the Jordan Junior Aviation League, under the direction of Willis C. Brown, has been doing some excellent work. Picture No. 17 shows one of its members, Hewitt Phillips of 1 Spinney Terrace, Belmont, Mass., with a model autogiro which he has constructed in great detail. It is an exact copy of the Pitcairn Tandem. All details have been carried out. Phillips has recently established some Junior world's records, and now that he has turned Senior, he is already giving the top-notchers a hard push.

### On the Frontiers of Aviation

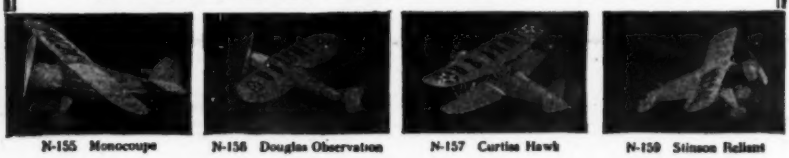
*(Continued from Page 13)*

stability even though the wing has no dihedral. The company says that it is the first American racing plane to have a "bullet nose." Wing flaps cut the landing speed 6 miles. The ailerons are statically balanced with lead weights inside the wing. It was this ship that was flown by Roy Minor to second place in the Thompson Trophy Race.

The other smaller racers compared to a lesser degree with the performance of Roy Minor's Brown racer.

The Henderson brothers, backed by many years of experience, ran the races as they should be run, but there are still one or two minor flaws to be ironed out before next year's contest. Most of the trouble came from the announcer's stand, where Jack Story, Ted Winters and Bernhard Capehart reigned supreme. The announcers tried hard and undoubtedly their steady talking into the microphone day after day, made them quite weary. But nevertheless they missed a few important events that should have been brought to the public's attention. However, I doubt if we could get any better announcers than those three who are so popular and who have taken such great interest in aviation.


## CONSTRUCTION SETS



N-155 Monocoupe | N-156 Douglas Observation | N-157 Curtiss Hawk | N-159 Stinson Reliant

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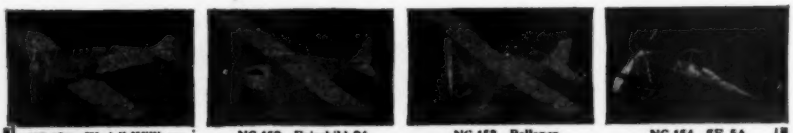

NC-151 Wedell-Williams 17½" wing spread | NC-152 Fairchild 24 20" wing spread | NC-153 Bellanca 20" wing spread | NC-154 SE 5A 15" wing spread

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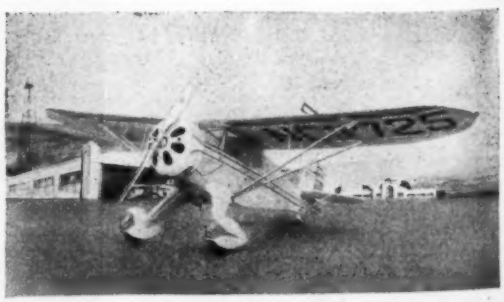

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On Friday, August 31st at 9:30 A. M. the meet opened with the National Championship Finals of the Cleveland Press-Scripps-Howard Model Contest. There were several excellent flights made by fuselage tractor models.

Following was a parachute contest of great interest. As usual Roger Don Rae, pilot of "Miss San Franciscan" as well as being a noted 'chute jumper, was among the winners. Each day at least one of the jumpers was carried off the field after making an abrupt landing, (much to the public's joy and enthusiasm). Fortunately there were no serious injuries.

Capt. Al Williams displayed his skill in precision stunt flying daily in his famed Curtiss Hawk.

Aviation on parade, "A Century of Aviation Progress," was a new feature of the races, celebrating the first air race ever held, which took place in France, one of the participants being Glen Curtiss. Such planes from the Lincoln Beachey pusher to the new Stinson tri-motor were flown around the field to show the progress made in the last twenty-five years. An old Standard at the tail—very far at the tail—of Major De Seversky's racer looked like the "Hesperus" in her last days compared with De Seversky's fleet plane. Johnny Livingston, ex-race pilot, demonstrated one of the latest Wacos in the air parade.

The First Pursuit Group, U. S. Army Air Corps from Selfridge Field, led by Capt. Tourtellot, performed daily in their new Boeing low-wing pursuits, eighteen of them in all. They, as well as the Navy and Marine corps, were half of the show. They exhibited graceful maneuvers, swift power dives, ground strafing and smoke screen laying.

Flt. Lieut. R. L. R. Atcherly of England and Gerd Achgelis of Germany did their special type of crazy flying, Atcherly being harnessed on the back of his Fledgling as if riding a horse.

A 10,000 foot delayed 'chute race by Clem Sohn and Wayne Wagner opened everyone's mouths as the two daring men nose-dived towards earth.

Art Davis, Roy Hunt, Harold Neuman, Charles Abel with his glider and Milo Burcham were other fliers that put on shows that could not be beaten. Milo's stunting was the best ever seen.

A system was put into effect this year by which the participants were fined if they did not begin their performance at the designated time. Thus several events overlapped each other, but increased instead of decreased the value of the show. At one time Milo Burcham, the Marines and Gerd Achgelis, tried to monopolize the air at the same time, thus giving the show the earmarks of a maniac's picnic or a winged version of the old chariot races at Rome. The crowd looked on aghast and were hoping against hope that they might have their first opportunity to see a smash-up. However none occurred.

After the day show, the public was also treated to a night show equally as excellent. It consisted of illuminated parachute jumps, stunt flying, formation Navy flying, fire works and many other novel features.

On the last day of the races, the popular Thompson Trophy Race was held. The three Wedell-Williams piloted respectively by Doug Davis, Roscoe Turner, Johnny Worthern, took the lead immediately followed by the Brown special, Miles & Atwood, Howard Ike, Chester Special and other of the smaller ships. Roscoe Turner was an easy winner in this hundred mile race, but seemed a little the worse for wear when he finished. His helmet was ripped


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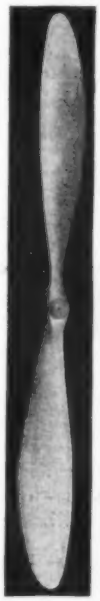

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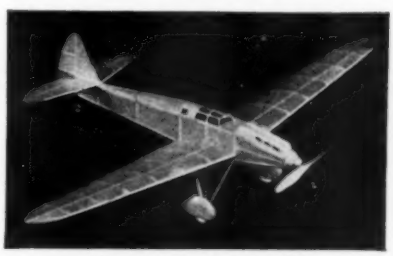

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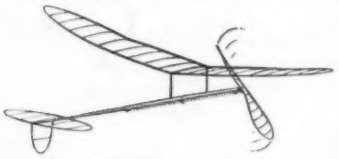

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**Just Restocked the Famous JASCO 3.5-5.5 Lbs. Indoor Balsa**

The wood that helps to make and break new world records. It is inspected 4 times, cut smoothly to exact size and graded for its best application. Used by the most discriminative experts. Prices and sizes are listed in our Special Indoor Supplies Catalogue. Send for your copy. It is free.

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**JASCO Special Triangular Sheet Balsa**

The wood that is responsible for such tremendous strides in glider duration. Just of the right weight. Takes drudgery out of glider building. Round off the leading edge and you have a perfect and a uniform airfoil section, and a good airfoil is one of the main requisites for efficient glider. No wonder gliders made from JASCO wood cannot help but make good time. This wood can also be used for many other purposes. It comes in two sizes.

3 x 24—10c—(Cut in half for mail) 2 x 18—5c
Fuselage Stock 1 x ¼ x 18.....3c
Tail Surfaces Stock 1/32 plus x 3 x 18.....5c

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Don't forget that it pays to be scientific. Get a Jasco **Beam Scale Kit.** Simple but accurate. 50c P. P.

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open and his black hair all mussed, was hanging out of the tear. It must have stood upright when Roscoe saw Johnny Worthern climb for altitude after his engine almost blew apart, and when Doug Davis spun to his untimely death. Johnny Worthern went back in the race with his faulty engine and started a steady fight from last place to get up in the lead. With each lap he passed one of his competitors, and at the finish he had once more gained third place, which was something of an achievement. Roscoe Turner's oversized and overworked engine was not functioning at its best at any time of the race nor did that of Lee Miles', who was forced to drop out near the end. Roger Don Rae was flying one of the Kieth-Ryders, which at any moment threatened to be wingless. The strain of former races had made the inside structure of the wing a rather heterogeneous mixture of wood and glue. But undaunted, the pilots kept buzzing around the pylons to the end. Everyone that saw that race certainly got their money's worth, but we hope that there will never be such an exhibition of dangerous flying like that again.

The Bureau of Air Commerce will undoubtedly lend a helping hand to the air racing association and see that their ships are more "aerodynamically correct," thus insuring more speed and safety for the National Air Races to come.

Following is a list of the racers and their approximate high speeds:

| | |
|---|---|
| Wedell - Williams 44 (Doug Davis) | 306 |
| Wedell - Williams 92 (Johnny Worthern) | 290 |
| Wedell - Williams 57 (Roscoe Turner) | 325 |
| Wedell - Williams (New) | 300 |
| Q. E. D. | 300 |
| Brown Special | 270 |
| Miles & Atwood | 250 |
| Chester Special | 235 |
| Kieth-Ryder "Miss San Franciscan" | 248 |
| Kieth-Ryder "Bumble Bee" | 215 |
| Howard Pete | 200 |
| Howard Ike | 260 |
| Howard Mike | 210 |
| Wittman Special III | 210 |
| Tilbury-Fundy Flash | 100 |
| Rasmussen | 100 |


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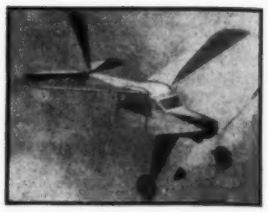

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A 22" wingspan cabin commercial. A completely finished model guaranteed to fly, complete with the following features: Hand-carved, hardwood unbreakable flying prop, shock absorbing spring landing gear, semi-balsa constructed making for greater strength and best flying qualities. Takes off under own power and makes a three point landing. **Price..... $2.50**

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**New "CYCLONE" Motor Sled READY**

**For Home Builders**

Now you can easily build Mead's new streamlined MOTOR SLED at home from drawings, parts or complete Construction Kit! Uses OUTBOARD or other engine. Amazing speed. Low cost. **PAY AS YOU BUILD.** RUSH 10c for Catalog No. 3. **ICE-BOATS,** Ki-Yaks, Sail-boats.
**MEAD GLIDERS, 12 So. Market, Dept. 1-K, CHICAGO.**



**INTRODUCING**

**The new simplified and beautifully designed flying 18" models made by SKYCRAFT and sold for 25c (plus 5c postage).**

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| **Macchi (Castoldi) Racer**<br>**Stinson Reliant**<br>**Monocoupe**<br>**Curtiss Swift**<br>**Boeing Fighter**<br>**Bellanca Airbus** | With finished propeller, wire parts, printed ribs and formers, wheels, cement nose plug, paper and full-size plan. |

Until now the entire production of these kits was sold to the New York enthusiasts. SKYCRAFT increased production and every air-minded boy can build them and be proud of his efforts.

In addition we carry in stock the complete lines of kits and supplies of the following well-known firms:

| | |
|---|---|
| **Ideal Aeroplane & Supply Co., Inc.** | **G. H. Q. Model Co.** |
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| **Construct-A-Plane Company** | **Berkeley Model Supplies** |
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The following supplies may be had in any quantity: Celluloid wheels, hard wood wheels, tissue paper, cut-to-size balsa wood, thrust bearings, cement, dope and acetone. We allow to dealers and clubs regular factory discounts.

**LEHR-O-PLANE**
1466 CONEY ISLAND AVENUE
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**These detailed, flying models were designed by a professional aero. engineer for builders seriously interested in aircraft design. Each kit is a model-making masterpiece containing over 50 items of the best material obtainable. The large plans are interesting and very easily followed. Each kit is packed in an attractive gift box. SATISFACTION AND PROMPT SHIPMENT GUARANTEED.**

**BOEING P-12-F (BELOW)**

Superb flight performance and lots of authentic details. Span 16", length 11.5", flying weight, 1.1 oz. Easily built from this big kit packed full of fascinating parts, including; a life-like pilot, instrument panel, pursuit squadron insignia, dope brush, carved propeller, printed balsa, lots of "A" grade supplies, and many surprise features.

**16" CURTISS SWIFT**

A powerful, low wing, army pursuit monoplane with a super-streamlined fuselage. A fast - flying model in army colors, with wing lettering and all insignia. The flying weight of this detailed model is less than 1 oz. (not illustrated).

**16" CURTISS GOSHAWK**

One of the Navy's fastest pursuits, a beautiful taper - wing biplane with "open side" pants and a "split" landing gear. This 100% detailed model is finished in yellow and white with a realistic pilot, instrument panel, and many original features (not illustrated).

**VOUGHT CORSAIR (above)**

A stable flyer in any weather, finished in authentic Navy colors. Span 16", length 11.75", weight 1 oz. A "slick job" easily built from this superb kit containing many time-saver features, as formed hooks, two-piece cowl, carved propeller, simplified wheel pants, and machine printed balsa. Complete kit contains 56 items.

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### How to Build a Solid Wood Scale Model of the Q.E.D.

**Plans Page 14**

If you wish to square-off the plans, thus making it easier for measuring, connect up the corresponding marks at border of plans with pencil. One square equals one square foot.

*Get dimensions from accompanying plan for purchasing the required material. Balsa wood is best to use.*

Draw the outline of side view of fuselage first on block of wood and cut to shape with saw. Then draw top view and cut off sides with sharp chisel. Go over the newly-cut surfaces with coarse sandpaper and then round out the fuselage with chisel or knife. Note cross-sections. If you have trouble in making the rudder, this piece may be made separate and then ambroided (glued) in place at tail of fuselage. Rub the whole surface of the fuselage with coarse and fine sandpaper.

Make the wing halves next. Draw the outline of the wing pieces on stock, making sure that the grain of wood runs lengthwise. The wing fillets may be made with putty or plastic wood during the assembly. Shape out the airfoil section with a chisel, referring to two cross-sections in lower left hand corner of plans. Sandpaper the wing thoroughly and lay to one side.

The stabilizer and elevator pieces may be made in exactly the same manner. Sandpaper these also.

The making of the landing gear is slightly more difficult, but you should have no trouble. Draw outline of the two wheel "pants" as you did the other parts and cut around the outline with a razor blade. Then, referring to cross-sections and front elevation, finish off the gear pieces. Sandpaper thoroughly. Using a small knife, hollow out the inside of the "pants" in order that the wheels, which may be purchased or made, may be inserted. A straight pin, inserted through the center of wheel and "pants," may act as axle. Sandpaper the "pants" once more.

Carve out the propeller and tail skid with your razor blade and begin the construction of the pilot enclosure. The panels may be made out of a fine grade of thin cardboard and cellophane used as a window-glass. Ambroid should be used for connections.

Dope all the parts just made a dark green except the number, 77, and nose, which should be black and the prop, which should be silver. The wheel tires should also be painted black. Several coats will have to be applied before a smooth finish can be obtained. Always let the first coat dry before applying the next one. Lay the painted parts aside until they are dry and then commence the assembly.

Lay the fuselage on a flat, level surface with the wing halves, one lying to each side of it. Using plenty of ambroid, connect the wing to fuselage. Put blocks under the wing tips in order to give the wing the correct dihedral. When the joints have thoroughly dried, fair the wing into the fuselage with putty or plastic wood as shown in plans, thus forming the wing fillets. Next ambroid the horizontal tail units in place with blocks to prop them up.

Next lay the model on its back and connect the landing gear, applying much ambroid to make the connections firm. Cut out a piece of wood with your razor blade ⅛ inch by ¼ inch by 1½ inches. Streamline it to the best of your ability and ambroid it between the "pants" where the axle was inserted.

Turn the model in normal position once more and pin the prop to nose.

"Wire" the model with black thread next. The plans show sufficiently where the threads are to be connected. The head part of a cut-off pin inserted in the model, would act excellently as anchorages for the threads.

When this has been accomplished, touch up all connections with ambroid and then paint. The model will then be completed.

### Aviation Advisory Board

*(Continued from Page 23)*

*Answer:* Yes, the plane will have a tendency to stall under this condition. However, the tendency is small because the amount of gas which is carried is very small and the balance of the ship is not affected to a large extent. If a large quantity of gas is to be carried, it should be placed directly over the center of gravity. In regard to correcting this stalling tendency, it is not advisable to do so, for the simple reason that a stalling tenden-


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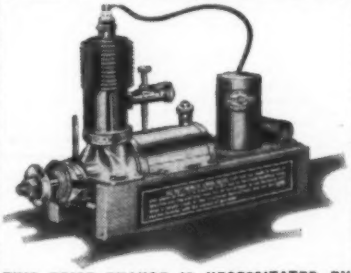

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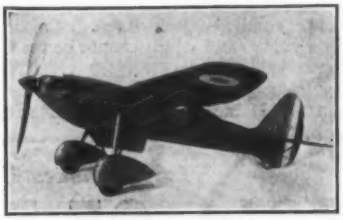
The latest of the Fokker fighters. Quick, snappy take-offs and flights combined with 90 sec. actual duration.
Wing span 24" Weight 1¾ oz.



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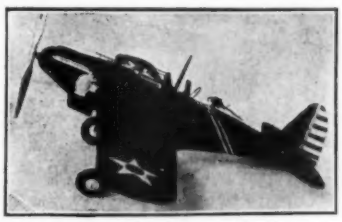
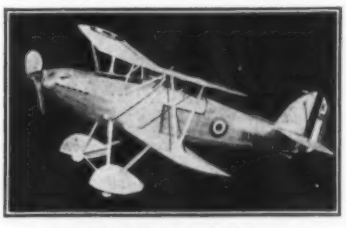


CONSOLIDATED P-30
U. S. A. answer to foreign challenge. Scaled down realistically in both detail and performance. Duration 60 sec.
Wing span 25¾" Weight 1⅝ oz.



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New Hyde Park, N. Y.


cy is desired most at the end of a flight inasmuch as this will help to hold the nose of the ship up and insure a flat glide.

*Question:* How much and to which side should the motor be turned to offset torque?

*Answer:* The motor should not be turned to offset torque. It should be perfectly straight. When the motor is turned either to one side or the other it usually produces dynamic forces in flight, under various flight conditions, which are disturbing to the airplane and which cannot be readily controlled

*Question:* Would a low-wing model, such as the Mohawk Pinto, be suitable for a gas model? I was worrying about the diving tendency of low-wing planes (as models). Could this fault be corrected by the use of the proper wing section? If so, which one?

*Answer:* A low-wing model would be suitable for a gas powered model airplane provided sufficient dihedral is given to the wing. There should be a dihedral of approximately one and one-half inches per square foot of span, in each one-half wing. A low-wing airplane will not have a diving tendency if the stabilizer is given a sufficient amount of negative incidence. We suggest two degrees negative. The diving tendency in a low-wing will not be corrected by the use of any particular wing section. This diving tendency may be partially eradicated by the use of a wing section in which the center of gravity moves very slightly or is stationary; for instance, some of the "M" sections.

Here is a question from Harry Benson of 1420 160th Street, Beechhurst, L. I., New York.

*Question:* Does arranging the wheels at an angle so that the tips are turned upward and the lower part inward, help in any way?

*Answer:* Putting the wheels on a plane at this angle allows them to turn more freely when the chassis supports the weight of the plane. It also helps to hold the wheels in place on the axle. This, however, is a rather unimportant consideration as there is little difficulty experienced in placing the wheels at an angle or in a vertical position unless the landing gear has a great deal of strength, so that when it supports the weight of the plane the wheels have a tendency to turn upward at the bottom and inward at the top.


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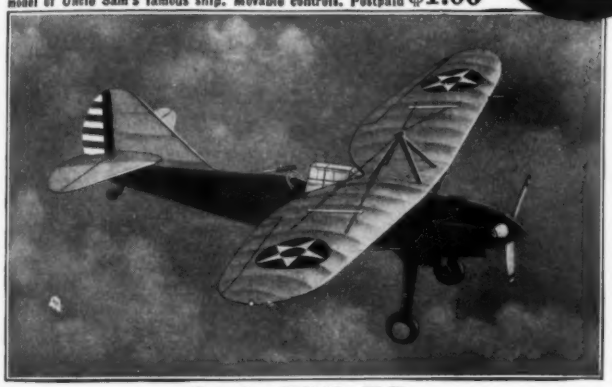

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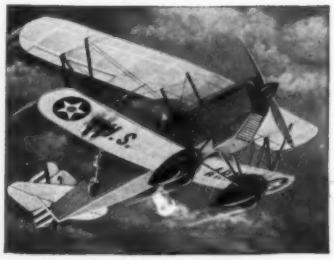

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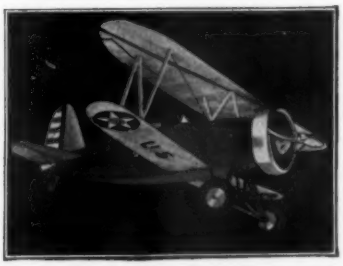

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